the OIL AND GAS JOURNAL

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Wherever there's rotary drilling, there's a Hughes representative ready and anxious to be of service to you. His recommendations reflect the Hughes Tool Company "know-how" gained through years of laboratory research and field experience. Anywhere in the U. S. his record of reliable rig delivery assures the right rock bit on your rig at the right time.

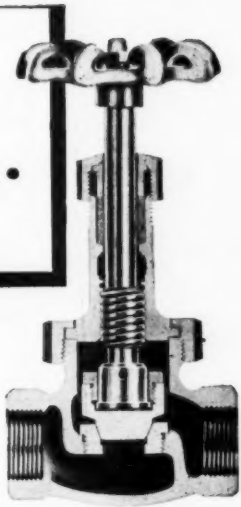
Reliable Service is another example of the Hughes determination to provide an "Engineered Solution" for your every drilling problem.

HUGHES
TOOL COMPANY
HOUSTON, TEXAS
WORLD STANDARD OF THE INDUSTRY

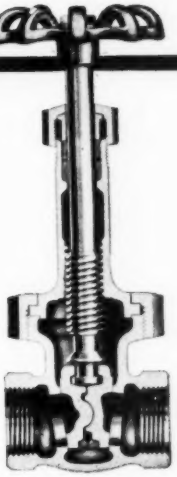
PRICE 50 CENTS TABLE OF CONTENTS PAGE 49 AUGUST 11, 1949

FABRICATED
and ERECTED
by Wyatt's
22' diameter vacuum tower and 18' diameter atmospheric tower fabricated and erected for a major engineering construction company. All field welds radiographed.
Wyatt's
HOUSTON - DALLAS

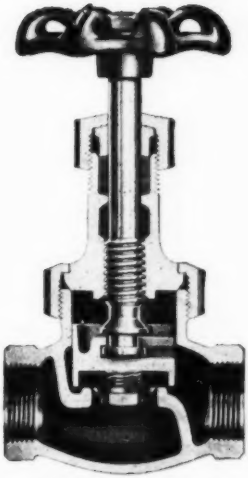
Walworth bronze valves...



Walworth No. 225P Globe Valve
500 Brinell Seat and Disc



Walworth
No. 29 Gate Valve



Walworth No. 95 Globe Valve
Re-New-Disc

built to give dependable trouble-free service on all recommended jobs

Walworth No. 95 Bronze Globe Valves (Angle Type: No. 96) are recommended for service where throttling is not required. They are rated at 150 psi working steam pressure, 500F; 300 psi cold water, oil or gas. The improved renewable disc and lock-on, slip-off disc holder — an original Walworth development—saves time and trouble. This valve can be repacked under pressure when fully opened. All parts are designed to give maximum service and strength.

Walworth No. 29 Bronze Gate Valves are rated at 200 psi working steam pressure, 550F; 400 psi cold water, oil and gas. These valves have rising stems and integral seats. Sizes 2-inch and smaller have union bonnets; sizes 2½ and 3-inch have bolted bonnets. Valves up to and including ¾-inch have solid wedge discs; 1-inch and larger have split wedge discs. These valves can be repacked under pressure when fully opened.

Walworth No. 225P Bronze Globe Valves (Angle Type: No. 227P) are rated at 350 psi working steam pressure, 550F; and 1000 psi non-shock service on cold water, oil and gas. The stainless steel, plug type seat and disc — heat treated to 500 Brinell — can be closed on sand, slag, scale and similar floatage, without injury to the seating surfaces. They are the longest wearing, TOUGHEST bronze valves you can buy.

For full information about Walworth Quality Bronze Valves, see your Walworth distributor, or write:

WALWORTH
valves and fittings
40 EAST 42nd STREET NEW YORK 17, N. Y.

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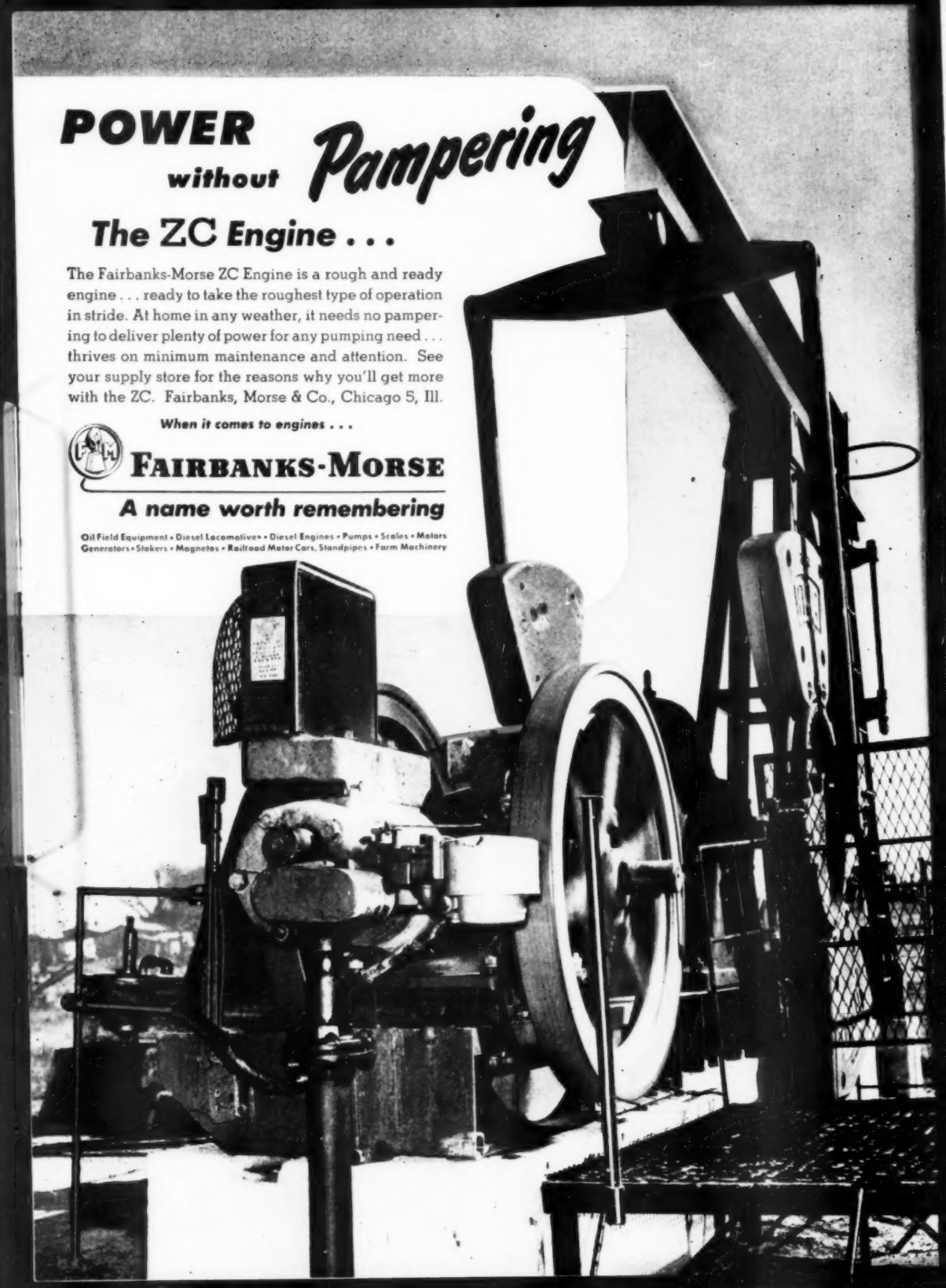
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The ZC Engine . . .
The Fairbanks-Morse ZC Engine is a rough and ready engine . . . ready to take the roughest type of operation in stride. At home in any weather, it needs no pampering to deliver plenty of power for any pumping need . . . thrives on minimum maintenance and attention. See your supply store for the reasons why you'll get more with the ZC. Fairbanks, Morse & Co., Chicago 5, Ill.
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FAIRBANKS-MORSE
A name worth remembering
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Illustration indicates the care with which each part is constructed for maximum service. Grades of Ampco aluminum bronze are varied for each part to deliver longest service and best performance.

It's a *special* pump at *no* extra cost

You don't have to pay special production costs for bulky, over-size corrosion-resistant pumps. Ampco's centrifugal pump is a standard production model, designed to handle corrosive and erosive liquids — for a *standard-model* price.

Check these important features:

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- Wearing rings are centrifugally cast of Ampco Metal—wear-and erosion-resistant to protect casing and cover, and maintain efficient running clearance.
- Strong, corrosion-resistant impeller withstands hydraulic shock, cavitation, and erosion by abrasives in suspension.
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- It is the only bronze pump that can be repaired by welding (with Ampco-Trode electrodes of proper grade to match the base metal).
- All sizes available for either pedestal or close-couple mounting.

The efficiency and durability of this pump have been tested and proven in the petroleum, chemical, food-processing industries, and in breweries. We know this Ampco Pump *cuts your original equipment costs and your replacement costs.* Get complete information from your nearest Ampco Field Engineer, today!

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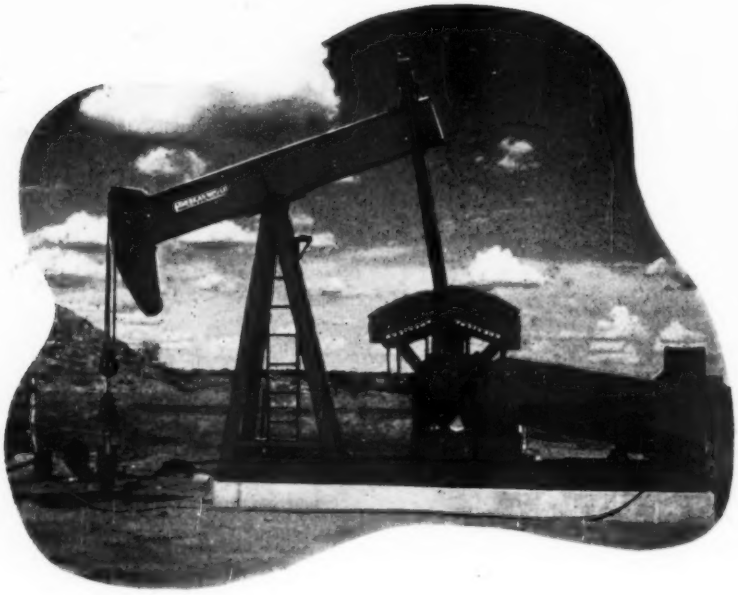
AMERICAN Pumping Units



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You can choose from many different combinations of structure and reducer sizes of American Units. This wide range of sizes makes it possible to get an American Unit for the most efficient service on your wells.

Every American Pumping Unit, from the husky little T-5 to the big, powerful T-27, is designed to A.P.I. standards.

For longer service with less servicing, and a bigger return on your pumper investment, specify AMERICAN... proven by 25 years of service to the oil industry.

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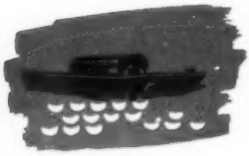

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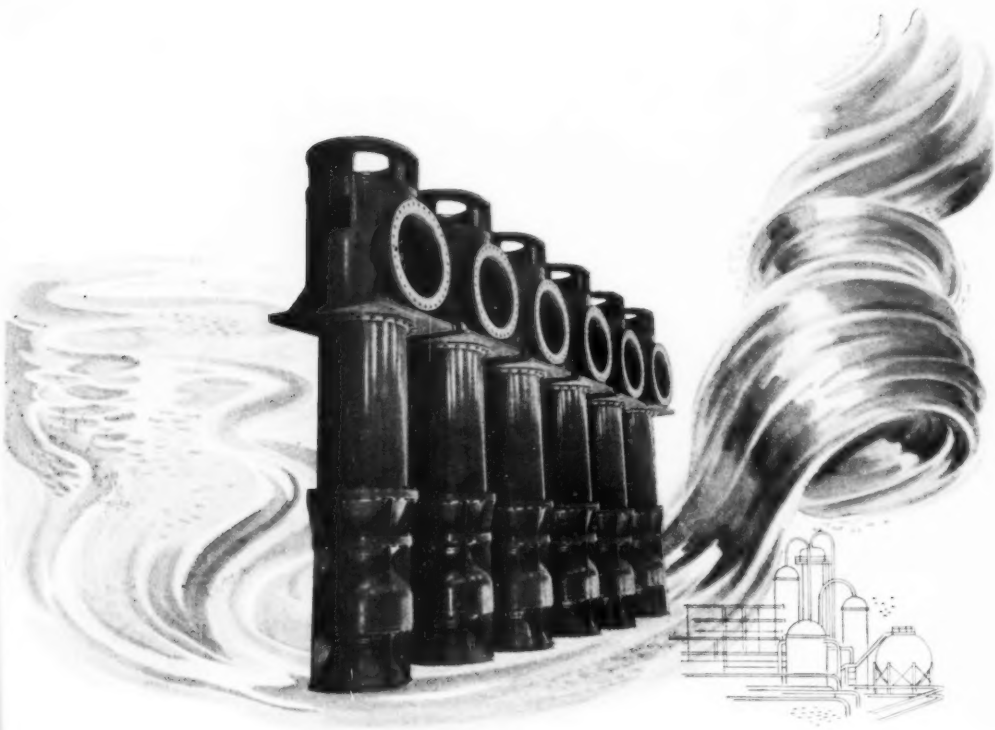

WHEN YOU NEED TO LIFT A RIVER

Gasoline made from natural gas will soon flow from the Carthage Hydrocol plant in Texas. The process gives off so much heat that the engineers called for cooling water amounting to a river 20 feet deep, 225 feet wide moving at 4½ feet a minute.

Pacific Pumps was assigned to build six pumps because it has unequalled facilities for tailor-made jobs. The pumps are vertical centrifugals of monel and steel, lifting 144,000 gals. per minute of salt water, some of the largest ever built. Dresser Industries got the job because it is big enough and versatile enough to design the equipment required.

The Biggest Jobs Are Going to Dresser. For information on these or any centrifugal pumps, withstanding any kind of corrosion, any temperature, or pumping any heretofore unheard of volume, write to Dresser Industries, Inc., Terminal Tower, Cleveland, Ohio.

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for the Oil Industry—
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DRESSER
INDUSTRIES, INC.
TERMINAL TOWER • CLEVELAND 13, OHIO

NEW BOOK TELLS latest advances in pipe-protection methods

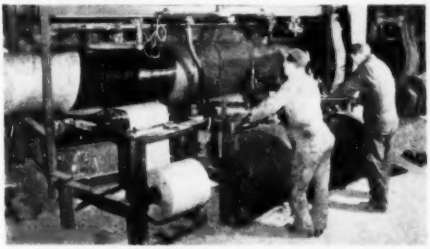
Here in one handy, illustrated book is your newest, most complete information on pipe coating and wrapping.

With on-the-job photographs . . . brief but carefully-documented text...Hill, Hubbell explains the processes that assure *longest, most efficient* protection for your pipe-line installations.

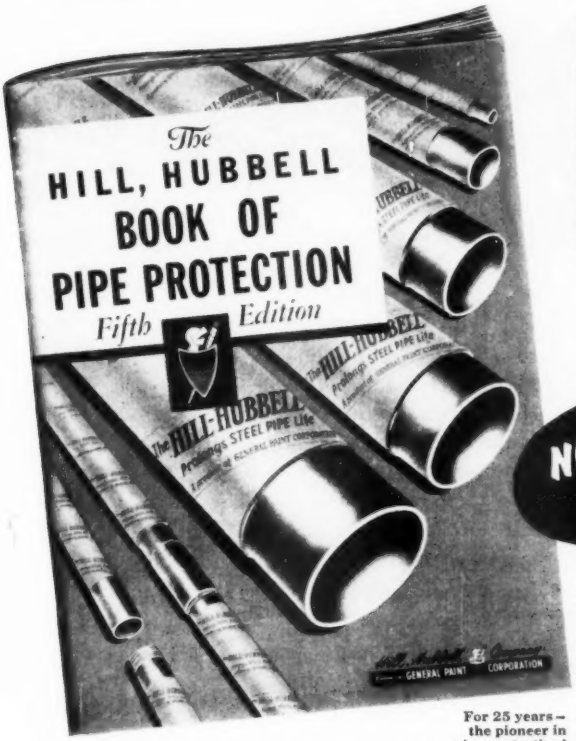
Useful! Informative! Hill, Hubbell's new "Book of Pipe Protection" explains—

- Plant storage
- Why pre-heating
- Cleaning
- Coating and wrapping applications
- Inspection methods
- Delivery scheduling
- Load unit-shipping
- Field handling

PAGE 12. This angular grit-blast machine removes every trace of mill scale, rust, dirt. Leaves pipe surface metal-bright for positive bond of protective coatings.



PAGE 15. This heavy-duty machine applies any standard specification of coating and wrapping. Hill, Hubbell is equipped to process all sizes of pipe from ¼" nominal to 30" O. D.



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Division of General Paint Corporation
3091 Mayfield Road • Cleveland 18, Ohio

Please send me, without obligation, your new 5th edition of the Hill, Hubbell Book of Pipe Protection.

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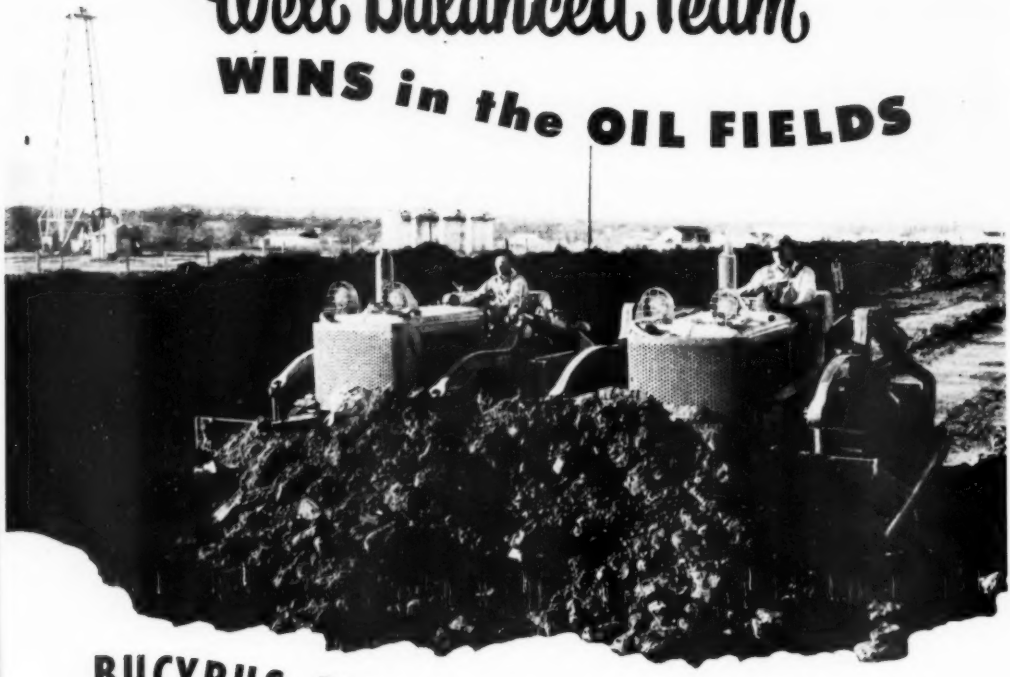
3091 MAYFIELD ROAD CLEVELAND, OHIO

Well-Balanced Team
WINS in the OIL FIELDS



BUCYRUS-ERIE Bulldozers and INTERNATIONAL Crawlers

When you match up a Bucyrus-Erie Bulldozer with an International tractor you have a real earthmoving team — perfectly balanced to take full advantage of every ounce of tractor power. There is no balance-upset to cause loss of traction or excessive wear. Maximum force is concentrated at the blade. Fuel and power are saved. Work is accurate.

The scientifically curved Bucyrus-Erie blade rolls dirt, keeps it alive on the move — does more work per tractor horsepower.

A safe low-pressure hydraulic system guards against overheating that causes breakdown of oil structure. Leakage at hose connections and pipe joints is avoided. There's no "ride up" with the positive hydraulic down pressure of a Bucyrus-Erie blade.

Here's a team that can save you money — matched up to move more dirt per dollar invested. Stop in and see for yourself — Bucyrus-Erie Bulldozers are sold and serviced by International Industrial Tractor distributors everywhere.

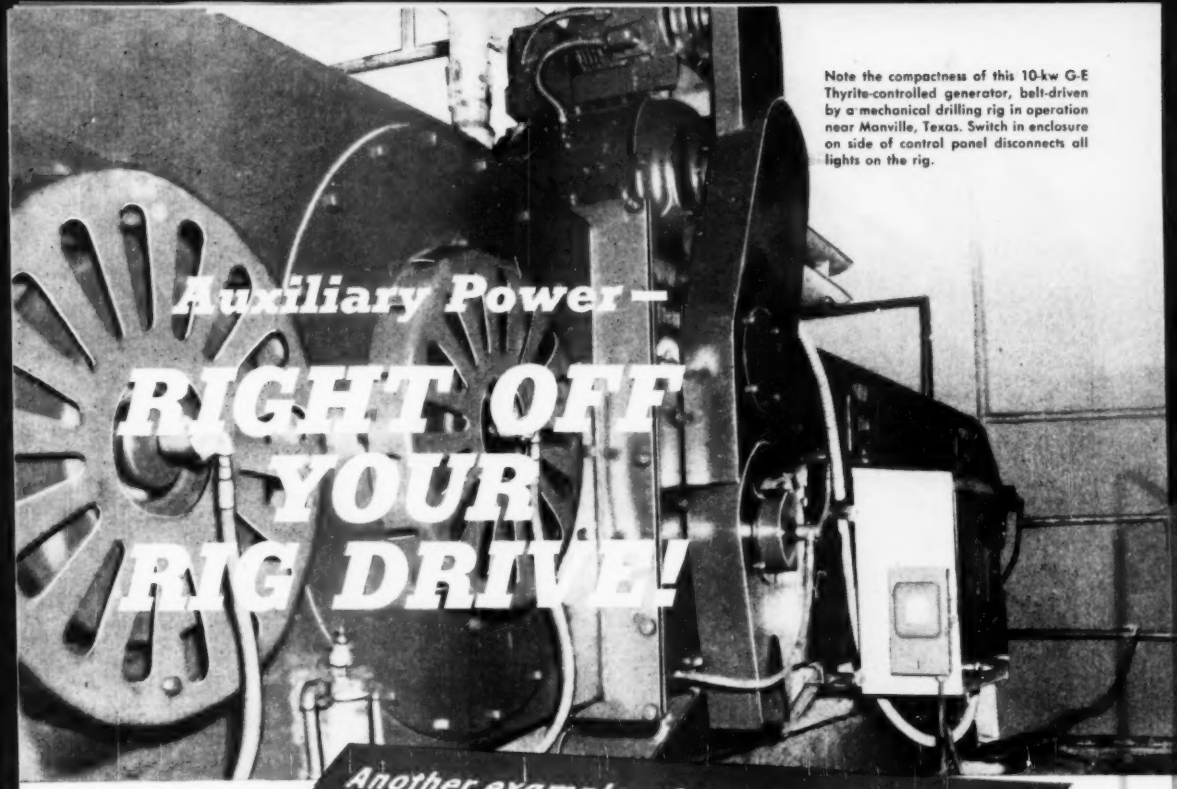
Two TD-14's are teamed up with Bucyrus-Erie Bulldozers to dig this reserve pit. Digging slush and reserve pits, trenches, and ditches, backfilling and road maintenance are only a few jobs where this matched equipment assures big working capacity and big savings.

BUCYRUS ERIE

SOUTH MILWAUKEE
WISCONSIN

See Your INTERNATIONAL Industrial Tractor Distributor

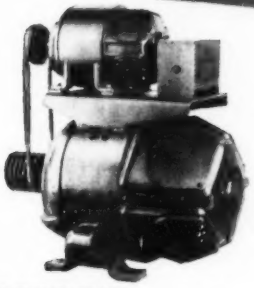
157749



Note the compactness of this 10-kw G-E Thyrite-controlled generator, belt-driven by a mechanical drilling rig in operation near Manville, Texas. Switch in enclosure on side of control panel disconnects all lights on the rig.

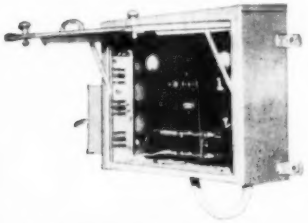
Auxiliary Power— RIGHT OFF YOUR RIG DRIVE!

Another example of General Electric oil field electrification!



SIMPLE INSTALLATION!

A G-E Thyrite-controlled d-c generator—completely factory-assembled to simplify installation—consists of d-c generator, d-c exciter, Thyrite resistor, and exciter field rheostat.



ACCURATE ADJUSTMENT!

An exciter field rheostat, like the one shown in this typical control panel, accurately adjusts the generator's output voltage. Suitable panels can be supplied on request.

Yes, here's a simpler, less expensive way to provide the auxiliary electric power you need for lights and small motors. Drive a generator directly from your main rotary rig engines instead of adding an auxiliary engine.

How? Just belt a G-E Thyrite-controlled d-c generator to your main drilling engine. You'll get dependable, constant-voltage power direct from a variable-speed source. And you can cut out the cost of buying, operating and maintaining an extra engine. No voltage regulator is needed, either, with this self-regulated generator.

Output voltage is kept constant within plus or minus four per cent over a 4:1 speed range which amply covers the full extent of main-engine speed variations. Voltage correction for a change in load takes only two seconds at low speed, less than a second at top speed. Your nearest G-E office will be glad to supply further information. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

HOW OIL FIELD ELECTRIFICATION CAN CUT YOUR COSTS!

For deeper, faster drilling—for wider use of automatic recovery methods—for more efficient operation of gathering, branch and pipe lines—for scores of other oil production uses—electrification offers you cost-cutting advantages not found in any other type of oil field power. It's all fully, vividly shown in "Lease on the Future", a General Electric full-color and sound motion picture on oil field electrification. A showing will be arranged gladly by your nearest G-E office. Don't miss it!

More Power to America

GENERAL ELECTRIC

661-7

SAVES { This reducer / This weld

Not only does this Midwest reducing welding elbow save one entire fitting and one weld; it reduces turbulence and improves appearance. Actually, you save time, money and material—and you get a better piping job. You'll probably find other ways to save on piping when you read Bulletin WF-41. Write for your FREE copy today.

Better Fittings for Every Piping Job

Midwest Welding Fittings include these important advantages: unusual dimensional accuracy, elbows forged to final size in compression dies, uniform wall thickness and true circular section. They're as close as your near-by Jones & Laughlin Supply store, where you'll find your supply problems understood and your business appreciated.

JONES & LAUGHLIN
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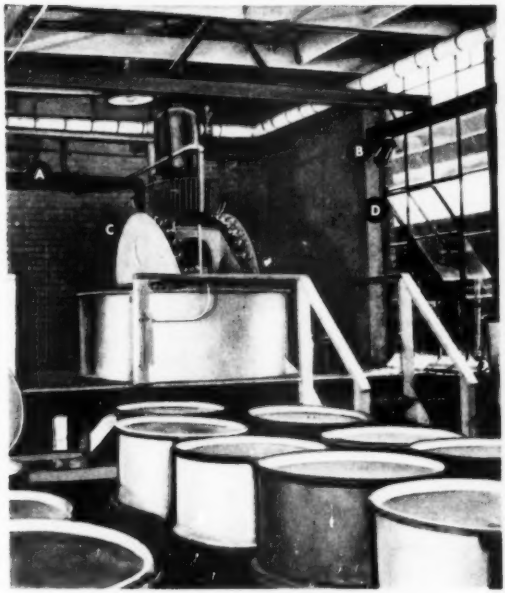
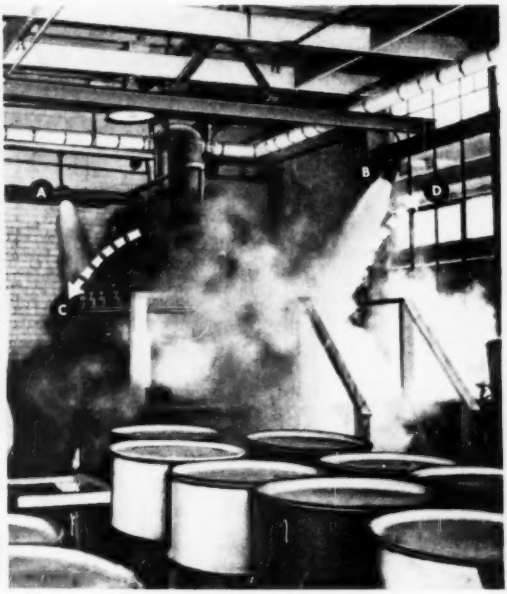
Watch how this Kidde system —puts fire in its place!



Kidde Multijet Nozzles (A and B) stand ready to flood the room with flame-smothering carbon dioxide (CO_2) if a fire should break out. Hatches (C) on mixing tank and window (D) are held open by latches connected to *Kidde* pressure trips.



Here the system goes into action in a test simulating fire-fighting operation. CO_2 discharges from nozzles A and B, and also actuates pressure trips, allowing hatches C and window D to close. Fire is shut out of the tank—isolated from the rest of the plant.

Large quantities of volatile solvents go into the manufacture of printing inks at Shellmar Company, Mt. Vernon, Ohio. It's a fire hazard calling for thorough protection and fast action. That's why Shellmar turned to Kidde!

Here the *Kidde** System does a double job. It can put fire out in a matter of seconds, by flooding the room with fast-acting, non-damaging carbon dioxide (CO_2). And it isolates the fire to prevent any possibility of spreading even during the brief extinguishing period.

System is completely automatic in action—on guard at *all* times. It is self-contained—requires no additional power source.

That's just one of the ways in which *Kidde* equipment can be adapted to specific hazards. Whatever *your* fire-protection problem, a Kidde representative will help you.

When you think of CO_2, call Kidde!

*Also known as "LUX"

The words "Kidde" and "Lux" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

Walter Kidde & Company, Inc. • 854 Main Street, Belleville 9, N. J.

Kidde

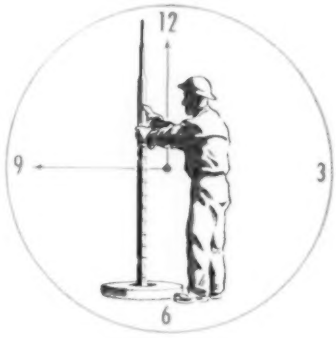
The

Schlumberger

electrical log saves you hours

of costly rig time

● Schlumberger Recording Cameras and instruments are designed to record several curves at one time and two films simultaneously. Thus, the necessary curves can usually be obtained on one trip in the hole with substantial savings in rig time and greater safety to crews and well bore investment. When you call Schlumberger, you get the best!



SCHLUMBERGER
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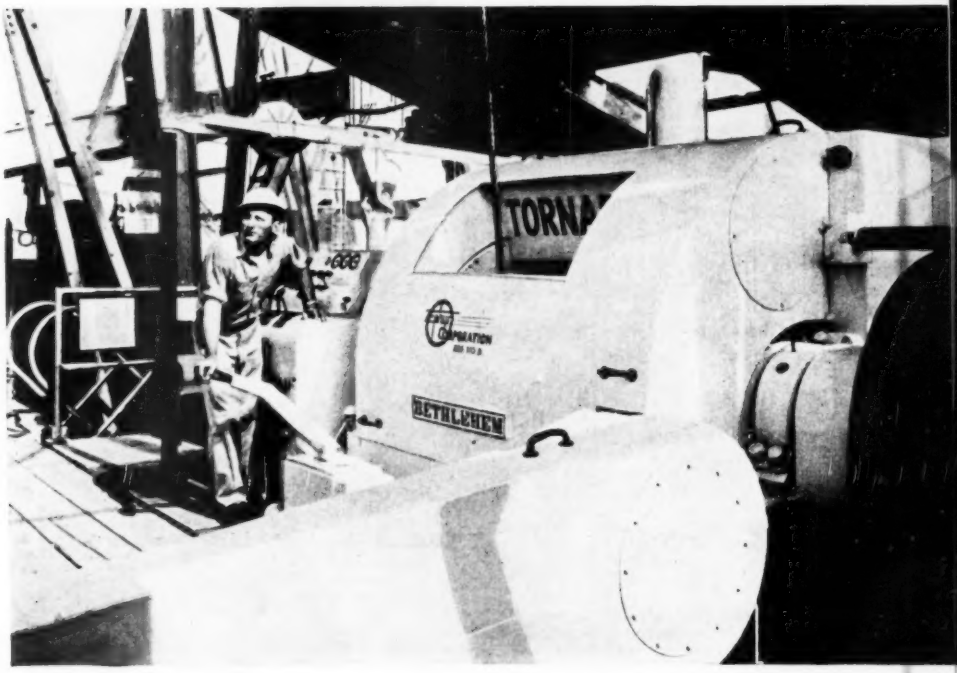
BETHLEHEM TORNADO

... a Truly GREAT Rig for Deep Drilling



Powerful, of course. But power isn't the whole story, not by any means.

In designing this rig, we wanted something pretty special—power *without* complicated mechanisms; power smoothly flowing, smoothly controlled; power so well bridled that the driller would always be in complete command.

Bethlehem's Tornado is 100 pct air-controlled, and levers are only inches away from the driller's normal position. Operation is further simplified by air-actuated, self-adjusting clutches. Speed changes can be made instantly. The air-cushioned transmission reduces shocks, jars, and jolts.

In the field, Tornados have brought a new kind of smoothness and flexibility to deep-hole drilling. We're proud of these rigs, and we'd welcome the chance to tell you more about them.

BETHLEHEM SUPPLY COMPANY

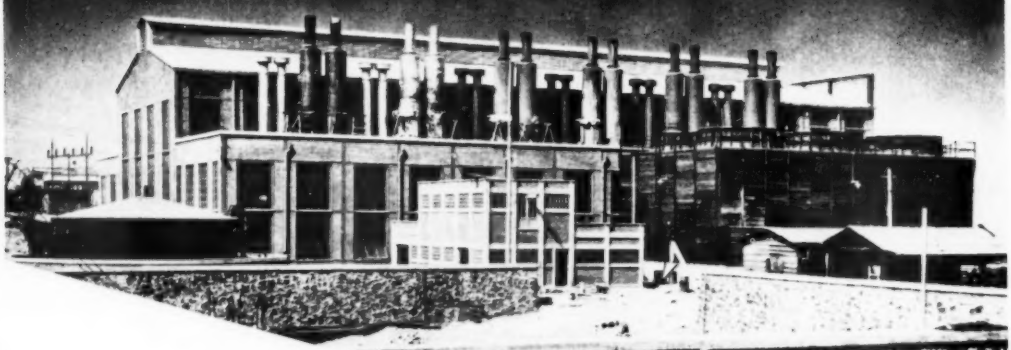
General Offices: 21 E. Second Street, Tulsa, Okla.

Subsidiary of Bethlehem Steel Corporation

On the Pacific Coast Bethlehem Oil-Field Equipment is sold by Bethlehem Supply Company of California

BETHLEHEM STEEL

Dust can't damage these diesels!



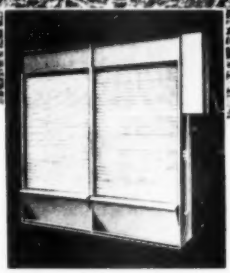
AAF Multi-Duty Filters protect mammoth Nordberg Diesels at Mexico City power plant

THERE'S plenty of dust "down Mexico way" but it will never be a source of engine troubles at Mexico City's new diesel electric power plant at Tacubaya. Each of the six 7325 h.p. Nordberg Diesels is served by an AAF Multi-Duty Type CMS air filter having a capacity of 7000 CFM.

With such a tremendous investment at stake, it is only natural that they should select the filter that has proved itself in engine and compressor service throughout the world. The Multi-Duty Type CMS is both automatic and self-cleaning. Its overlapping screen panel curtain insures both the delivery of a uniform volume of air and a positive self-cleaning action. Operating resistance remains fixed when once established for a given dust concentration. The Multi-Duty is truly automatic, requiring no attention other than periodic inspection and removal of sludge at regular intervals.

At Tacubaya the filters were installed inside the plant directly above the rotary compressors. However, where outside installation is desirable, the Multi-Duty filter can be supplied as a housed unit. This housing consists of front louvres for protection of the filter curtain and a plenum chamber designed to dampen intake pulsations and distribute air flow uniformly.

With proper planning and protection, dust damage need never be a threat to your engine and compressor operations. AAF engineers will be glad to supply the right answers to your dust problems. Write today for complete information.



Get Bulletin No. 150A

Gives you complete data on Multi-Duty filters for engines and compressors. It's free for the asking.

AMERICAN AIR FILTER COMPANY, INC.

444 Central Avenue, Louisville 8, Ky.

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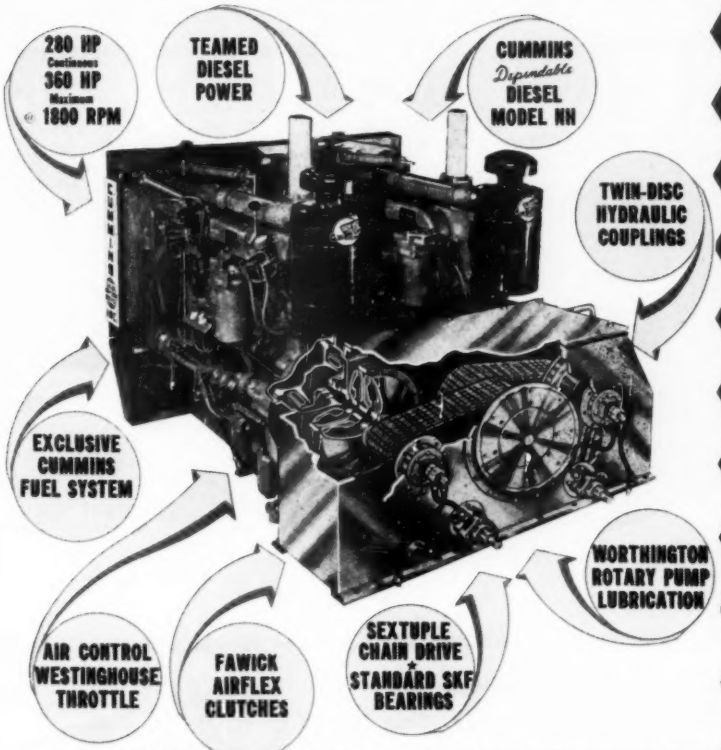
AAF

AIR FILTERS

AND DUST CONTROL EQUIPMENT

CUMMINS DIESELS
Engineered to give TEAMED POWER



Here's *POWER* as you need it! The Dual NH Cummins Dependable Diesel Hydraulic Power Unit, with its two NH-600 Cummins Engines, is economical and dependable. Economy is *PROVEN* by fuel consumption charts showing that these engines use 25% less fuel.

The Dual NH Hydraulic Unit is adaptable to any job in the oil fields. When your continuous horsepower demand is great, a multiple of these easily compounded units will solve your problem.

Highly flexible power, smoother operation and elimination of shock loads, torsional vibration and excessive strain are assured by the hydraulic feature.

Round-the-clock Cummins Service is readily available for NH-Hydraulic Units, designed and assembled by Cummins Sales and Service, Inc. It will pay you to standardize with Cummins Dual-NH Units!

Write today for Bulletin DNH-100 which gives complete information on the Dual NH Cummins Dependable Diesel Hydraulic Power Unit and the dual unit with mechanical drive for use with torque converter.

CUMMINS SALES & SERVICE, INC.

GENERAL OFFICES FORT WORTH, TEXAS

EIGHT FACTORY TYPE REPAIR BRANCHES WHERE TRAINED EXPERTS GIVE 24 HOUR SERVICE FOR CUMMINS DIESELS

FORT WORTH — HOUSTON — ODESSA — WICHITA FALLS, TEXAS
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Features of DUAL NH Unit

- DEPENDABLE DIESEL POWER
- SMOOTHER OPERATION
- VERY COMPACT—HIGHLY PORTABLE
- MORE POWER FOR LESS FUEL
- ACCURATE ENGINE CONTROL
- AIR OPERATED HYDRAULIC THROTTLES
- STURDY CONSTRUCTION
- ELIMINATES SHOCK LOAD
- HIGH TORQUE AT STARTING SPEEDS
- FOUR CYCLE ENGINE FOR ECONOMY
- STANDARD, EASY TO GET PARTS
- PRESSURE LUBRICATED AIR CLUTCHES AND HYDRAULIC COUPLINGS
- MAXIMUM STALL TORQUE

Twin-Disc Hydraulic Couplings

These fluid couplings are extremely simple both in principle and mechanics. Wear and breakdown are reduced practically to zero. The hydraulic couplings break the solid connection between the power source and the driven equipment . . . providing a point at which the power is transmitted entirely by the mass and velocity of moving oil.

Fawick Airflex Clutches

The Fawick Airflex Clutch provides the solution to the ever-present problem of adequate clutch to match the improved construction available in other components of advanced design power transmission. Use of the "air" principle gives a "cushion" action to protect both the driving and driven members from the destructive effects of telegraphed vibration.

Parts Available At Supply Stores

Because this Cummins Dependable Diesel Power Team uses well-known and standard items, parts can be obtained at your supply store, and most mechanics are familiar with its operation.

CUMMINS Dependable DIESEL POWER

HANDLE DRILLING EQUIPMENT BY AUTOCAR

Out in the oil fields, where extremes of load and road are common, Autocar trucks perform with remarkable dependability, because they are engineered for the extremes of heavy-duty hauling. That is why C. K. Bennett, of Healdton, Oklahoma, hauler for various drilling contractors, specifies Autocars for his operations. He owns two of them, each equipped with a 70,000-lb. winch—a Model C-70-S with a 16-ft. body, and a mighty Model DC-10064-S Autocar-Diesel with 19-ft. body. Between the pair of them, Bennett can haul any piece of equipment anywhere.

AUTOCAR TRUCKS

They cost less, because they do more work

Manufactured in Ardmore, Pa.

Factory Branches and Distributors from Coast to Coast

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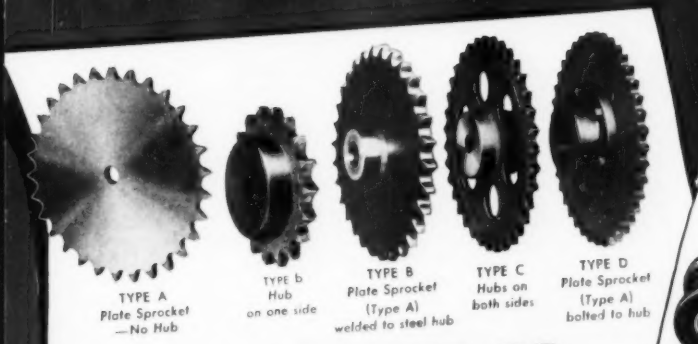


TYPE A Plate Sprocket —No Hub

TYPE b Hub on one side

TYPE B Plate Sprocket (Type A) welded to steel hub

TYPE C Hubs on both sides

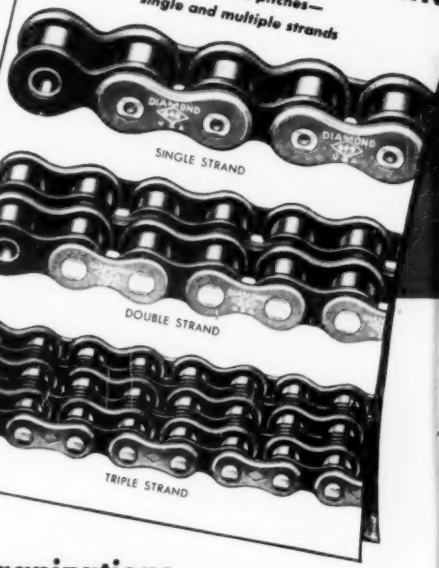
TYPE D Plate Sprocket (Type A) bolted to hub

A LARGER LINE OF DIAMOND STOCK SPROCKETS

For single and multiple strand chains

COMPLETE STOCK OF DIAMOND ROLLER CHAIN

All standard pitches— single and multiple strands



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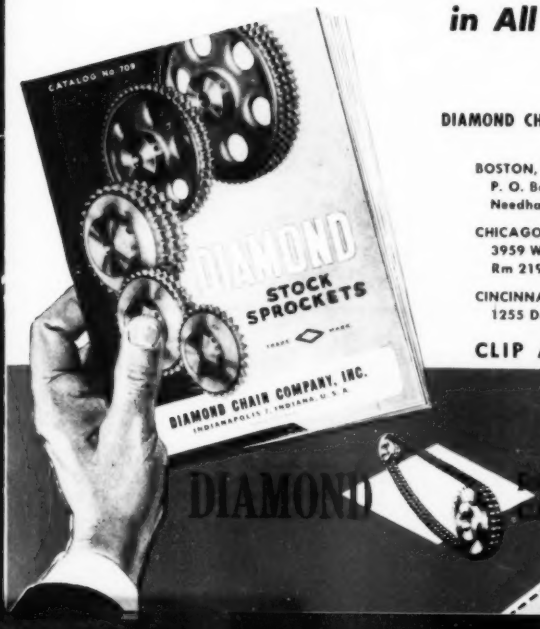

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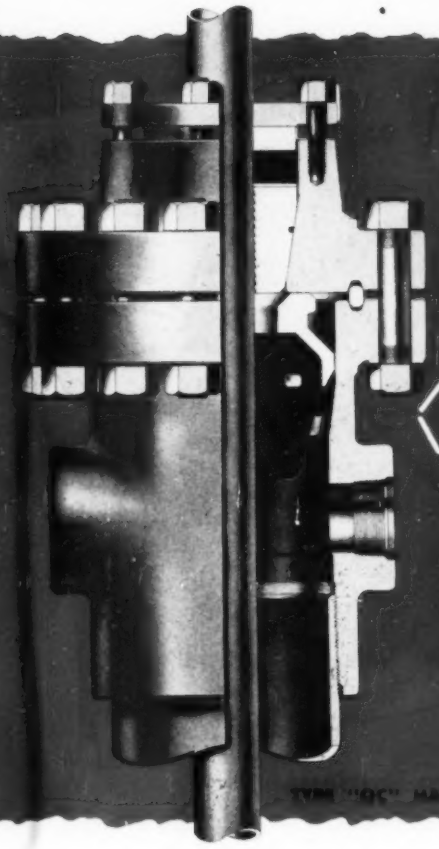
HIGHEST QUALITY FORGED STEEL API FLANGED TUBING HEADS NEED NOT BE COSTLY



FOR EXAMPLE, THIS

Cameron

FORGED STEEL TUBING HEAD

SIZE 6" SERIES 600 CLASS STRIPPER

COSTS ONLY

$96.00

TYPE "QC" HANGER

Cameron's mass production methods have made possible this fine forged steel flanged tubing head at a price comparable to that of ordinary threaded top type tubing and pumping heads. Having a standard API flanged top connection, this head eliminates the need for, as well as the cost of, an adapter should it ever become necessary to install a flanged valve or blowout preventer above.

Four types of tubing hangers, lock screws, and a stripper rubber are optional. The heads are available in API, Series 400, 1000 Lbs. W.P. and Series 600, 2000 Lbs. W.P. models.

The assembly shown above is also available with a bonnet threaded male by female for suspension of tubing . . . at an even lower price.

Complete details will gladly be sent on request.

Optional Hangers

TYPE BC TYPE BCB TYPE BCQ

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Export: 74 Trinity Place, New York, N. Y. Oklahoma: 310 Thompson Bldg., Tulsa (Telephone 28970). California: Long Beach (P. O. Box 267). Wyoming: P. O. Box 708, Casper (Telephone 1577). North Louisiana: Bossier City (P. O. Box 425). Texas: Odessa, P. O. Box 431 (Telephone 3112), Corpus Christi (Telephone 28783), Fort Worth (Telephone 46522).

In this, the current advertisement in Standard Oil's institutional series, millions of readers of newspapers and farm papers throughout the Midwest are reminded that all the employees and dealers of a great company are working to keep them supplied.

SIX OF THE MEN WHO HELP YOUR STANDARD OIL DEALER KEEP YOUR TANK FILLED

America used 18.9% more oil last year than in 1945, our peak war year—and yet, although a shortage had been feared, there were enough petroleum products for everyone last winter. This summer, with automobile travel at an all-time high, you can still get all the gasoline you want.

How is this possible? Only because the great efforts of the entire petroleum industry made it possible. Through teamwork, this company and its subsidiary companies have set output records in each of the last three years.

Standard Oil works as an integrated team, from the oil well to the service station. That's why we were able to bring you more oil; because we work together from the ground up to find oil, to bring it out of the earth, to carry it to refineries, to make it into useful products and distribute them to convenient locations in your community.

We are willing to spend for new oil wells, pipelines, refinery units, to help keep you supplied. In the last three years, these costs amounted to more than twice our net earnings.

We have the manpower—48,000 employees, from geologists to tank truck drivers. Like the independent businessman who fills your tank at his service station, each of these men is important to your gasoline supply.

STANDARD OIL COMPANY (INDIANA)

GRANT DARNELL of Houston, Texas—engineer. He's testing the drilling mud that helps us get beneath the surface of the earth to find oil.

JOHNNY HATCHER, at work on Drilling Rig No. 12, High Island, Texas. He and his fellow crewmen work to bring oil to the surface.

LLOYD M. KING, pipeline maintenance man, Niota, Illinois. He helps keep oil flowing on its journey from the wells to a Standard Oil refinery.

GEORGE P. NEIDERKORN, stillman, Wood River, Illinois, refinery. In the huge catalytic cracker he helps run, gas oil is converted into gasoline.

MATHEW SIMAGA, tank car loader at our Whiting, Indiana, refinery. He sends the finished products of the refinery on their way to Standard Oil bulk plants.

STANLEY BETTS, agent, who runs our Burlington, Wisconsin, bulk plant. He serves our dealers, filling the tanks from which your tank may be filled.

FOR IMMEDIATE SHIPMENT — CALL METAL GOODS

Now you can put corrosion-resistant Monel* Heat Exchanger Tubing to work for you — without delay! A stock of ¾" OD x 0.065" (16 BWG) and 0.083" (14 BWG) wall x 16' long Monel* Tubing is on hand for fast delivery from our Houston warehouse.

Where high corrosion resistance plus strength and toughness are needed . . . count on Monel* for *all* these advantages:

VISIT THE 4th NATIONAL INSTRUMENT EXHIBIT
MUNICIPAL AUDITORIUM
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See our display in BOOTH 131

- **Readily fabricated, and expanded into Tube Sheets.**
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- **Stands up in caustic soda reboilers and in condensers for chlorinated solvents and furfural.**

For shipment TODAY . . . phone, wire or write your nearest Metal Goods warehouse.

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OFFICES AND WAREHOUSES: St. Louis, 5250 Brown Ave. • Houston, 711 Milby St. • Dallas, 6211 Cedar Springs Rd. Tulsa, 302 N. Boston • New Orleans, 432 Julia St. • Denver, 817 17th St. • Kansas City, 1300 Burlington

HERE'S HOW NEW, BETTER "COROMAT"

THE IMPROVED UNDERGROUND PIPE WRAP

CUTS COSTS FOR YOU

Your wrapping crews can apply this new stronger "Coromat*" the improved underground pipe wrap *faster* . . . as much as 150% faster. And with practically a zero incidence of breaks in each 400-foot, 800-foot or 1200-foot roll . . . that means less starting and stopping of wrapping machines and less patchwork resulting from such stops. The new "Coromat" is almost 300% stronger than ordinary glass-type pipe wrap material, has specially designed glass-yarn reinforcing that vastly increases resistance to transverse tear.

And you still get all the cost advantages that you have been getting with the previous Fiberglas* Underground Pipe Wrap made by Owens-Corning . . . greater penetration of the wrap by the bitumen, lighter weight than any organic pipe wrap of comparable properties, complete freedom of the glass-mat wrap from rotting, complete inertness to the bitumen coating, and maximum reinforcing of the bitumen coating by the strong glass fibers and yarns that form "Coromat".

"Coromat" is the newest product of Owens-Corning Fiberglas research and engineering, has been tested in the lab and in the field. *Write today* for free samples of "Coromat" and a copy of the technical book "Corrosion Control for Underground Pipe". Write to OWENS-CORNING FIBERGLAS CORPORATION, Dept. 957, Toledo 1, Ohio. Sales offices in 27 leading cities.

FREE SAMPLE

FREE BOOK

OWENS-CORNING

FIBERGLAS

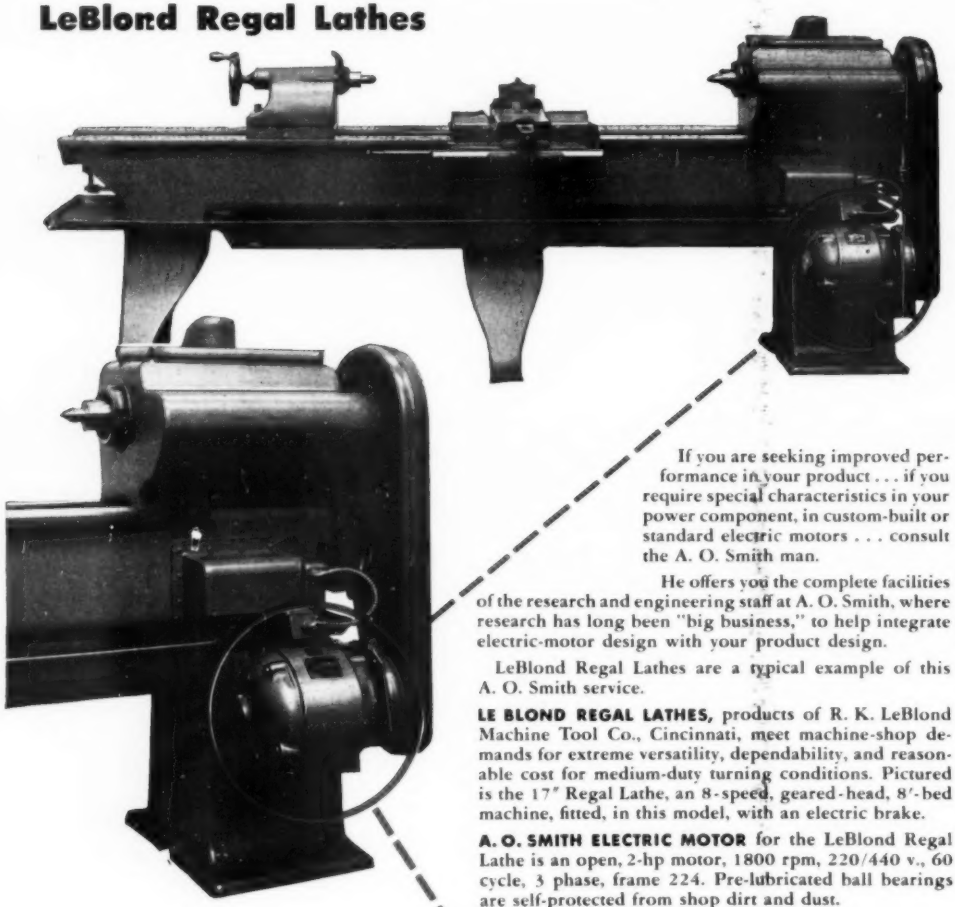
"COROMAT" PIPE WRAP

*Fiberglas (Reg. U. S. Pat. Off.) and Coromat are the trade-marks of Owens-Corning Fiberglas Corporation for products made of or with glass fibers.

A.O. Smith Builds ELECTRIC MOTORS

for hundreds of products, including

LeBlond Regal Lathes



If you are seeking improved performance in your product . . . if you require special characteristics in your power component, in custom-built or standard electric motors . . . consult the A. O. Smith man.

He offers you the complete facilities of the research and engineering staff at A. O. Smith, where research has long been "big business," to help integrate electric-motor design with your product design.

LeBlond Regal Lathes are a typical example of this A. O. Smith service.

LE BLOND REGAL LATHES, products of R. K. LeBlond Machine Tool Co., Cincinnati, meet machine-shop demands for extreme versatility, dependability, and reasonable cost for medium-duty turning conditions. Pictured is the 17" Regal Lathe, an 8-speed, geared-head, 8'-bed machine, fitted, in this model, with an electric brake.

A. O. SMITH ELECTRIC MOTOR for the LeBlond Regal Lathe is an open, 2-hp motor, 1800 rpm, 220/440 v., 60 cycle, 3 phase, frame 224. Pre-lubricated ball bearings are self-protected from shop dirt and dust.

Ask the A. O. Smith man about electric motors for both special and standard uses

WRITE FOR BULLETIN NO. EM-152

75th ANNIVERSARY 1874 1949

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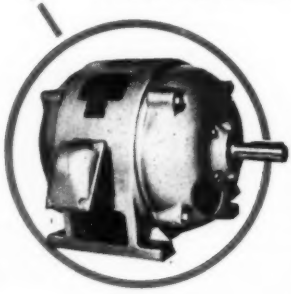
ELECTRIC MOTORS

A. O. Smith Corporation • New York • Boston • Cleveland Atlanta • Chicago • Detroit • Milwaukee • Houston • Tulsa Dallas • Denver • Seattle • Los Angeles • San Francisco Motor Export Department: 13 East 40th St., New York 16



24-HOUR MOTOR SERVICE

To more than 200 authorized service stations, A. O. Smith Product Service Division provides fast, low-cost electric-motor service, on a 24-hour, off-the-shelf basis. Factory Service Branches and Warehouses at Union, N. J., Chicago, Dallas, Los Angeles.

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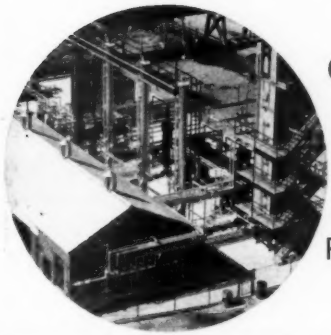

HYDROGEN PLANTS, FOR INSTANCE

Judge our qualifications by the company we keep!

Works speak louder than words, especially when we're talking gas processes and our ability to serve you well in that field. And probably the most convincing evidence of our qualifications is in the customers for whom we have done work.

For instance, take hydrogen, one among varied Girdler interests in gas processes. **Hygirtol* hydrogen manufacturing plants have been or are being put up by Girdler for the top-caliber companies named above.

Employing improvements developed by Girdler of the hydrocarbon-steam reaction and hydrogen purification, these plants manufacture high-purity hydrogen at lower cost than any other commercial method. Designed, engineered, and constructed by Girdler, they illustrate Girdler's complete service—service that has meant *effectiveness with economy* for just about every major industry concerned with a gas or chemical process.

If your business deals with any of the industrial gases, liquid and gaseous hydrocarbons, or organic compounds, you will find it pays to deal with Girdler for that new plant or improvements in the old.

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THE *GIRDLER* CORPORATION

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For a comparative analysis of all commercially feasible hydrogen manufacturing methods, write for "*Hydrogen*," Girdler's authoritative, comprehensive, 32-page booklet.

**HYGIRTOL* is a trade mark of The Girdler Corporation

K-68

the sheet packing that resists hot oil

K-68 is recommended for gaskets on all kinds of equipment handling hot oils, gasolines, naphthas, and aromatic fractions. Because it is sulphur-free, this sheet is also recommended for use in refrigeration equipment.

K-68 was developed for use in aircraft and diesel engines and to resist the solvent action of aromatic oils at high temperatures. It complies with the difficult specification AMS-3232.

This exceptional packing is composed of specially selected Chrysotile asbestos fibres, bonded with Neoprene only, under great pressure.

K-68 is just one of the highly reliable R/M packings made for service in oil fields, pipe lines, and refineries. For information on the full R/M line, and for your free copy of the R/M catalog, call your oil field supplier or the authorized R/M distributor near you.

R/M No. K-68

RAYBESTOS-MANHATTAN INC.

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R M

TEAM
POWER!
Sensational
Wilson
GIANT TORCAIR RIG
and
CUMMINS "Dual NH"
DIESEL HYDRAULIC ENGINES!
For The First Time!
Flexibly Teamed Engines
Successfully Combined with
World-Famed Wilson Rigs
Equipped with Air-Tube Disc
Clutches & Air Controls!
COMPARE PRICES
BEFORE YOU BUY!
Both are years ahead in engineered efficiency. NOW teamed to give you SMOOTHER, MORE FLEXIBLE POWER! The WILSON Giant Torcair is COMPLETELY AIR CONTROLLED, with FULL VISION PANEL CONTROL. Torque converter drives on 1, 2, or 3 engines. Full circulating water cooled brakes. Reverse speeds automatically engaged. Single or Multiple Engine Drive. Air-Tube Disc Drum Clutches. Full 42" Drum. The Cummins Diesel tends to overcome inadequate torque at starting speeds. This unit consists of two six-cylinder four-cycle Cummins "Dual NH" Dependable Die
Engines, two Clutches, and two Hydraulic Cou
assuring "cushioned power." Writ
BULLETIN 172.
Wilson
MANUFACTURING CO., INC
WICHITA FALLS, TEXAS

Look before you spend- the dollar you save may be your own!

LOW COST POWER'S career in the oil industry is an open book! In the bulky Utility Electric Power files are case after case showing that after close and unbiased analysis of the comparable factors, the decision could only be **ONE** way – **ELECTRIC POWER** through Utility Electric facilities! To begin with, the equipment cost is less. It's easier to transport! Maintenance expense and payroll are materially reduced! All of which adds up to more profit on the operation. These profit dollars belong to you—are you getting them? You can find out from your Power Engineer – the man who **CAN TELL YOU!** Ask for him at your nearest Utility Electric Company. Call, write now!

Use Utility Electric Power!

PETROLEUM ELECTRIC POWER ASSOCIATION

Box 1498, Oklahoma City, Oklahoma

'Old-timer' has a special meaning at Standard

They say you're not really an "old-timer" at Standard until you've been on the job at least 20 years...and at 30 years, there's a special company award: a gold watch and six weeks' vacation with pay.

That's appreciation of a man's service to his company, of course, but it also illustrates a principle we believe in for all employees—good people in good jobs serve *you* best, and we do everything we can to make jobs at Standard good.

Security, good pay and working conditions, advancement from within, free insurance, annuities at retirement are all part of making that principle a reality.

The average length of service of all our 17,890 parent company employees is slightly more than 11 years. And the 20-year "old-timers"? Fully 4,856 are working with us today.

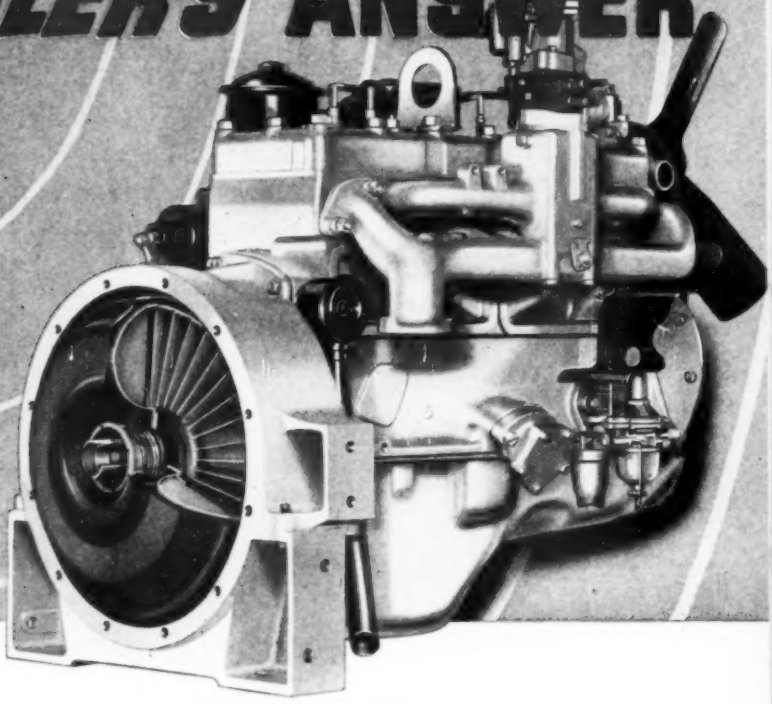
STANDARD OIL COMPANY OF CALIFORNIA

plans ahead to serve you better

gýrol Fluid Drive!

CHRYSLER'S ANSWER

to improved operation of over 50 types of gasoline powered equipment!



Do you build or operate any of this equipment? **Air Compressors • Airport Tractors • Bull Dozers • Carriers • Combines • Construction Hoists • Corn Pickers • Cranes • Ditchers • Earth Drills • Earth Moving Equipment • Farm Tractors • Forage Harvesters • Industrial Tractors • Industrial Hoists • Irrigation Pumps • Logging Donkeys • Materials Handling Equipment • Mining Hoists • Oil Pump Jacks • Oil and Water Drills • Oil Well Cementing Equipment • Road Graders • Road Rollers • Rock Drills • Saw Mills • Shop Lift Trucks • Shop Mules • Shovels • Sprayers • Sweepers • Tractor Shovels • Truck Mixers • Yarders.**

Think what a Gýrol Fluid Coupling between power and load would do in improving the operation of your equipment!

You can have it now on most Chrysler Industrial Engines at almost unbelievably little added cost. *Actually for only a few dollars more than the conventional flywheel which it replaces!* The same mass-produced Fluid Coupling proved on more than a *million* Chrysler, DeSoto and Dodge passenger cars and trucks over a period of 11 years.

Super-smooth power flow in gýrol Fluid Coupling gives better performance and better handling. It reduces maintenance costs and down time. It assures longer life for your equipment. It offers a host of special advantages for special operating conditions.

It will pay you well to investigate now. See your Chrysler Industrial Engine Dealer or write us. Parts and service quickly available everywhere. ***Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.***

CHRYSLER

Industrial Engines and Power Units

HORSEPOWER WITH A PEDIGREE

Positive Eye Protection . . .

AO F 9200 351A Goggles

AO F-9200 ACETATE SPECTACLE GOGGLE

Very popular because of its lightweight comfort and good looks, the F-9200 of transparent, non-flammable *cellulose* acetate protects against particles striking from the front—and is available with acetate side shields when needed. End pieces are set high—out of the line of sight for unobstructed vision. Side shields are perforated for ample ventilation and fog retardance of lenses.

Other Features: Comfortable nose pads which evenly spread goggle weight . . . light but sturdy keyhole bridge . . . 6 Curve Super Armorplate orbit-shaped lenses for maximum protection and visibility. Clear or Calobar. Medium, dark or extra dark lens shades.

For Refinery Work

AO 351A AIR CONDITIONED GOGGLE

Oil producers, drillers, well diggers, maintenance men on refinery stills and others who work in hot and humid atmospheres or cramped quarters like the ample ventilation of the 351A. Extension rings supply nearly double the usual air flow and prevent fogging, while protecting against particles striking from any direction.

Individual eyecups are shaped to eye contour, fit snugly and are low set for wide-angle vision.

Other Features: Insulated ball-chain bridge—easily adjusted . . . one-piece, quickly adjustable, rubber headband . . . 50 mm (regular or 6 curve) Super Armorplate clear or Calobar lenses in medium, dark or extra dark shades.

For Field Work

American Optical
COMPANY
Safety Products Division

Southbridge, Massachusetts • Branches in Principal Cities

When burning coke from header boxes and plugs, using pneumatic tools for turbining tubes, rolling tubes and heading up—for many jobs which require eye protection, AO Safety Goggles provide the maximum in safety and comfort. Order from your nearest AO Safety Products Representative.

REMOVE THE CAP . . . REPLACE THE BEAN

FASTER THAN CONVENTIONAL METHODS!

O-C-T PRODUCTION CHOKES GIVE YOU...

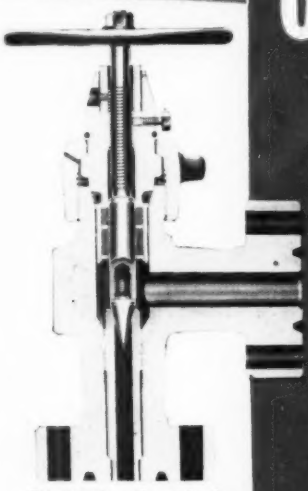
Economy — provided by incorporating an enclosed stem thread, replaceable stem point and "O" ring bonnet seal unit.

Speed — provided by the hand-tight flow cap; easily and quickly removed to change beans.

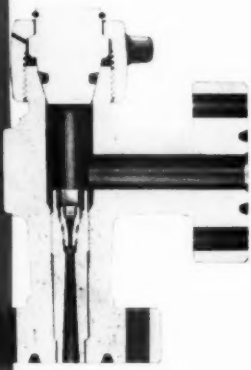
Flexibility — provided by the choke body design which is convertible to either positive or adjustable flow.

Strength — provided by the rugged and compact design with strength to withstand pressures far above the ratings.

Simplicity — provided by rugged, interchangeable parts.



JW CHOKE — The enclosed stem thread and packing unit provides a short, compact adjustable choke.



PC CHOKE—This positive choke accommodates beans from .0156" to 1" in either FC 142 PV Type or FC 140 Type.

In the new JW (Adjustable) Choke and the PC (Positive) Production Choke, O-C-T engineers have incorporated a hand tight flow cap design which materially speeds up the bean replacement operation. This cap holds full body pressure when only hand tight. By simply removing the hand tight flow cap, the bean replacement can be accomplished in a fractional part of the time required by conventional methods.

In addition, this same hand tight flow cap makes the new O-C-T Production Chokes easily and quickly converted from adjustable to positive chokes. Thus, a well may be cleaned with a JW Choke and quickly switched to a PC Choke for steady production.

Added economy is provided in the new O-C-T JW Adjustable Chokes by incorporating an enclosed stem thread, replaceable stem point and an "O" ring bonnet seal unit. The same choke body accommodates the PC Positive Flow Cap and a variety of flow beans.

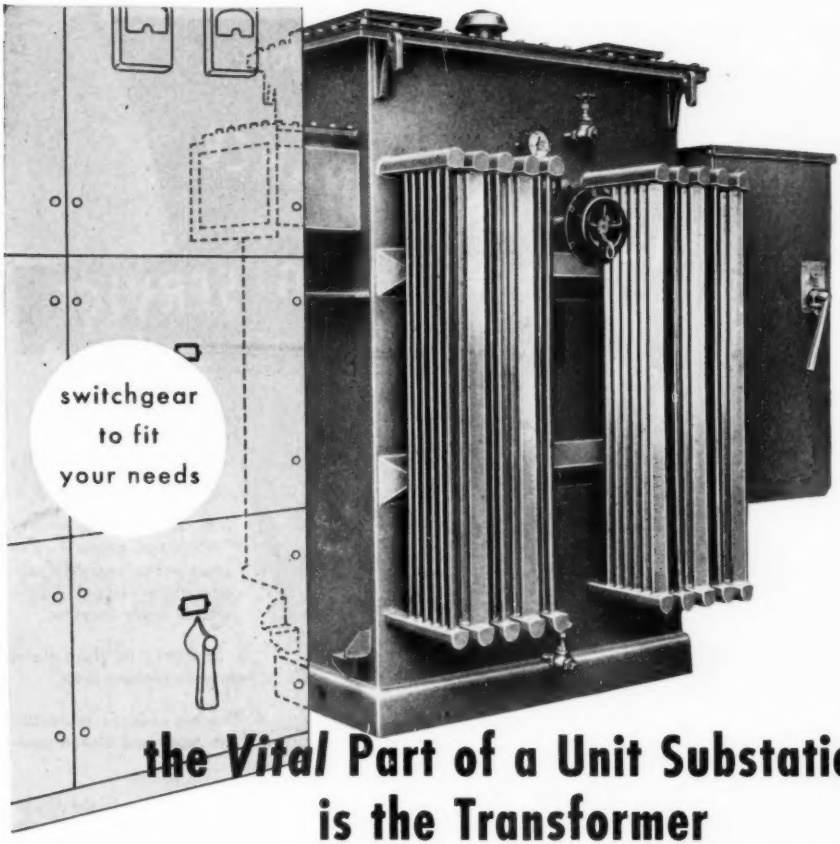
Check the other features of these new O-C-T Production Chokes. Talk to your O-C-T Representative or write for complete mechanical details.

ASSOCIATION OF WELL HEAD EQUIPMENT MANUFACTURERS CERTIFIED

Oil Center Tool Co.

P. O. Box 3091, Houston, Texas

Export Representatives: Venezuela, Colombia, Peru, and Ecuador—Berry & Hall, Apartado No. 304, Maracaibo, Venezuela—Sterling Assoc.—Le Grand, Sutcliff & Gell, Ltd., Southall, Middlesex, England. Address Export Inquiries for All Other Countries to P. O. Box 3091, Houston 1, Texas.



the *Vital* Part of a Unit Substation is the Transformer

• Wagner Unit Substation Transformers can be Throat Connected to any make of Switchgear...The transformer is the vital part—the fuel pump—of a load center distribution system. If the transformer fails, the entire system is dead, whereas only part of the distribution system may be affected by the failure of a switch or circuit breaker.

You can be sure of a dependable continuous flow of power from a Wagner transformer and you can be sure that it has been carefully designed to meet your distribution requirements.

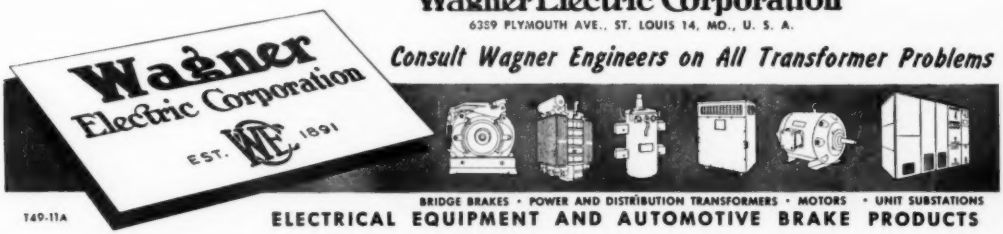
Wagner unit substation transformers with incoming high voltage switch sections to meet your requirements, and with proper throats on the secondary side for connection to any make of switch-gear, are available in the usual range of ratings up to 2000 kva. Our factory-trained sales engineers are well qualified to recommend the various combinations necessary to handle your unit substation requirements and will gladly give you immediate service.

Wagner unit substation transformers are installed in numerous electric generating stations and in all kinds of industrial plants including synthetic rubber, petroleum, steel, chemical, aircraft, automotive, paper, and many others. The importance of the transformer in a unit substation justifies calling in the Wagner sales engineer to help solve all your load center problems.

Our free bulletins TU-13 and TU-56 describe the design and construction features that make Wagner liquid-filled and dry-type unit substation transformers outstanding.

Wagner Electric Corporation
6359 PLYMOUTH AVE., ST. LOUIS 14, MO., U. S. A.

Consult Wagner Engineers on All Transformer Problems



BRIDGE BRAKES • POWER AND DISTRIBUTION TRANSFORMERS • MOTORS • UNIT SUBSTATIONS

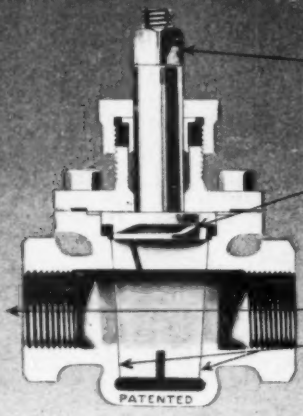
ELECTRICAL EQUIPMENT AND AUTOMOTIVE BRAKE PRODUCTS

T49-11A

Preferred for over 50 Years for...

LOW FIRST-COST
LOW MAINTENANCE
LONG SERVICE

and Quick, Positive Operation



1. Quarter-Turn fully opens or closes.

2. Cam serves as positive stop, and automatically seals valve against leakage by pressing seating surfaces firmly together.

3. Straight-line fluid flow. Minimum pressure drop.

4. Seating surfaces protected in both open and closed positions.

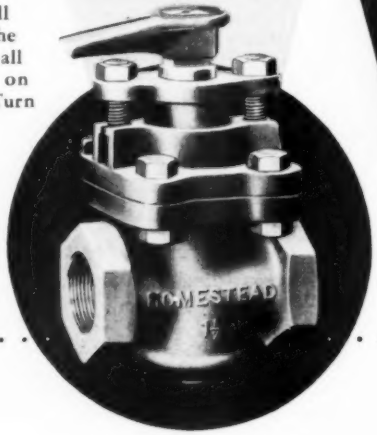
5. Homestead Cam-Seald Quarter-Turn Valves are made in straight-way, 3-way and 4-way types, and in metals for most valve needs; for pressures to 3,000 pounds, and temperatures to 750° F.

Besides being the most economical, maintenance-free, long service valves for handling air, water, gas, oil and other fluids, Homestead Quarter-turn valves are unsurpassed for quick, positive operation. A simple quarter-turn fully opens or closes them; and the patented Homestead cam holds seating surfaces in contact at all times. Seating surfaces are protected in both the open and closed positions so that corrosive fluids or grit cannot cause damage and valve failures. Straight, unobstructed fluid passage assures "full flow" and minimum line pressure drop.

To these important features add the rugged construction typical of all Homestead valves and you have the reason why hundreds of plants in all types of industry have insisted on Homestead Cam-Seald Quarter-Turn Valves for half a century.

HOMESTEAD

Cam-Seald QUARTER-TURN VALVES

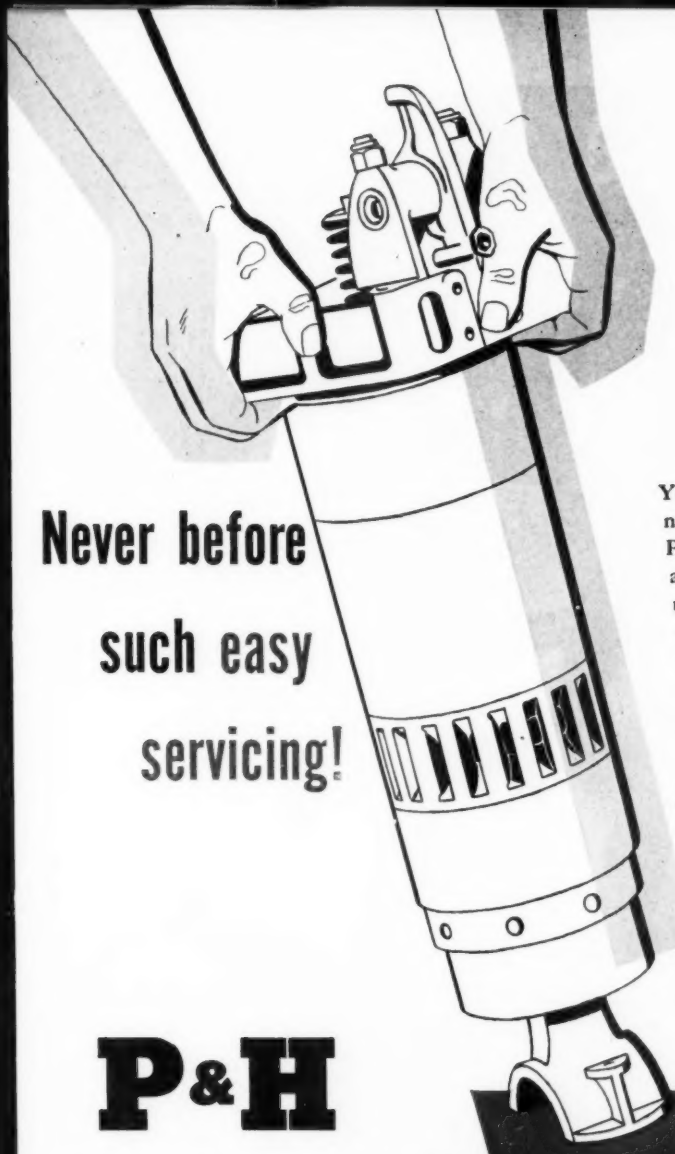


For complete information write for Valve Reference Book No. 38.

HOMESTEAD VALVE MFG. COMPANY

"Serving Since 1892"

P. O. BOX 403
CORAOPOLIS, PA.



Never before such easy servicing!

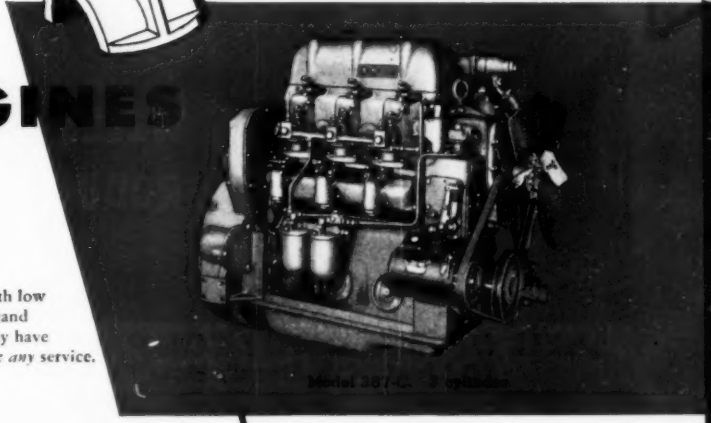
Yes, days of servicing or overhaul time are now shortened into hours with the new P&H Diesels. Cylinder head, liner, piston and rod assembly is quickly removed as a unit — without disturbing engine mounting — without even dropping the oil pan.

These complete cylinder assemblies are interchangeable, permitting transfer from one engine to another. It can be done right in the field. Lost operating time is cut to a minimum. Literature on request. Address Harnischfeger Corporation, Diesel Division, Port Washington, Wis.

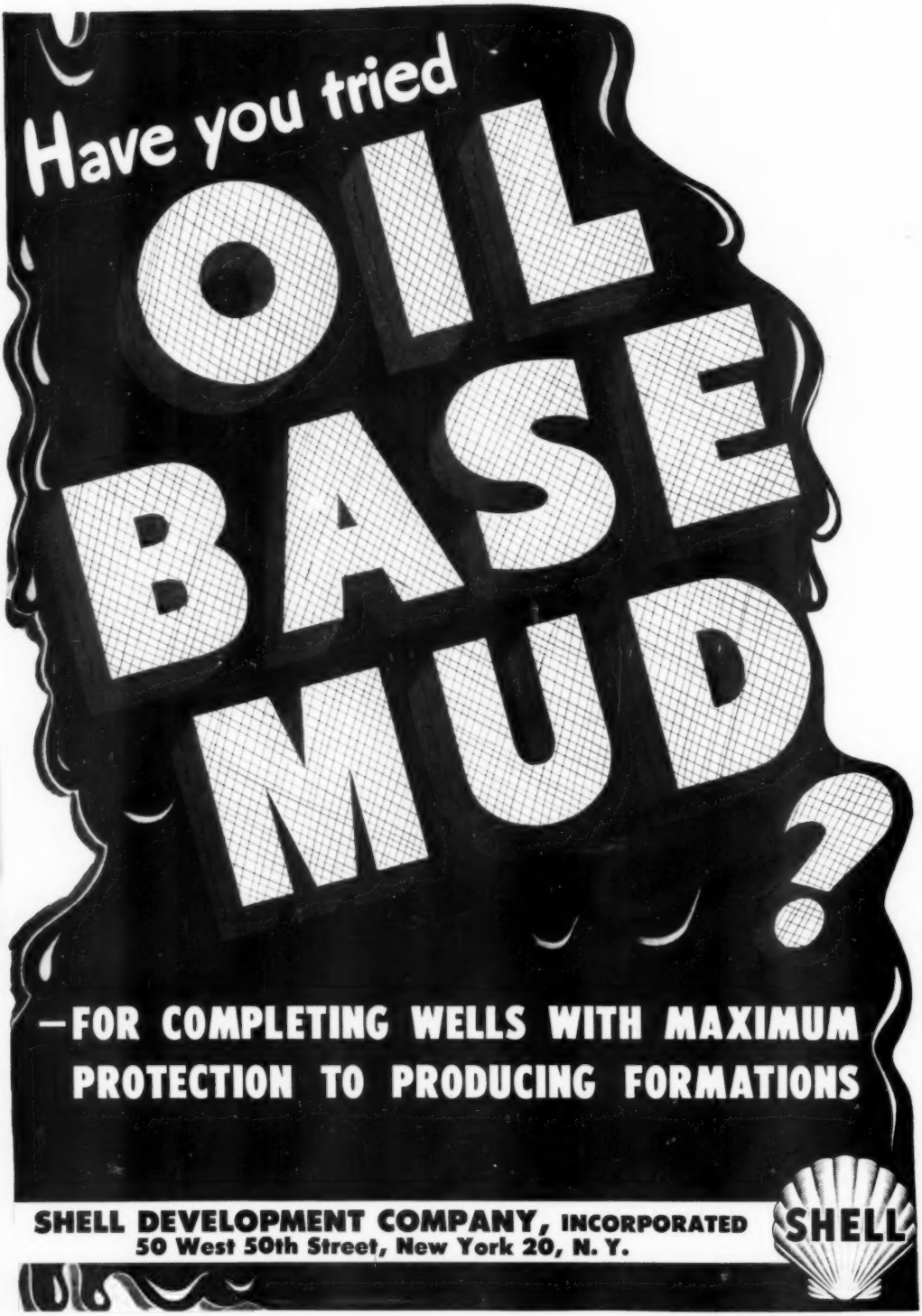
P&H DIESEL DIVISION HARNISCHFEGER CORPORATION

P&H DIESEL ENGINES

2 CYCLE



P&H Diesels are simplified, compact power units with low weight per horsepower. They are designed to withstand the severe power demands of excavator service. They have proved themselves in that service—are now ready for *any* service.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PROTECTION TO PRODUCING FORMATIONS
SHELL DEVELOPMENT COMPANY, INCORPORATED
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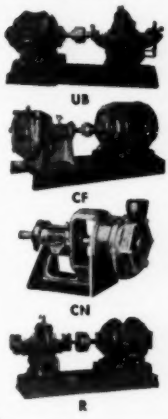
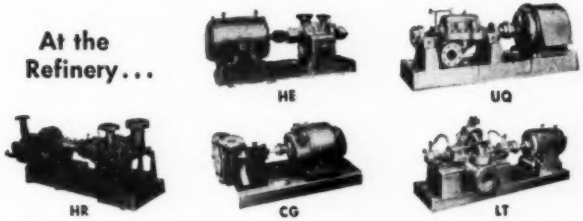
SHELL

"I could save real money if I could only centralize my purchases of pumps and standardize on one dependable make."
"You can! The complete Worthington line gives you the answer to almost any petroleum pumping problem."

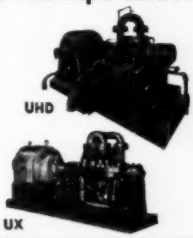
In The Field . . .



At the Refinery . . .



On The Pipe Line . . .



For Loading . . .

THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB

LET WORTHINGTON WORK WITH YOU

Yes, WORTHINGTON . . . the world's largest manufacturer of pumps . . . offers you complete service in petroleum pumps for applications in the field, in the refinery, on the pipe line and for loading operations. Why not take advantage of WORTHINGTON's long experience in petroleum pumping problems to lower your cost by standardizing on this single, dependable source?

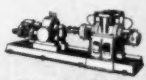
For complete information on any specific pumping application that will prove *there's more worth in Worthington*, write: *Worthington Pump and Machinery Corporation, Centrifugal Pump Div., Harrison, New Jersey.*

MEMBER

WORTHINGTON

C8.4

Types HR and HB. Twenty sizes. Capacities up to 1800 g.p.m. Developed heads up to 900 ft. Proper selection of material permits use for temperatures far below zero to 800°F., for pressures from high vacuum to 750 lb. per sq. in. gauge.

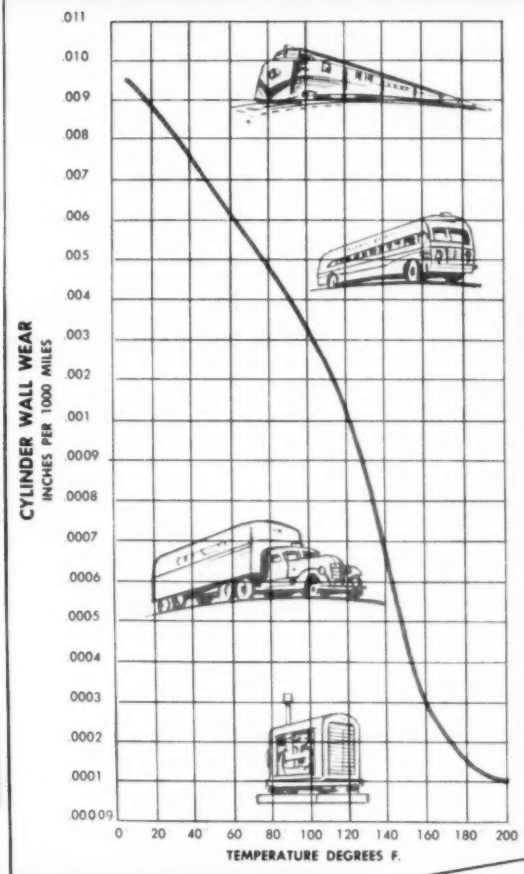


Type HD. Hydraulically-balanced, double-suction impeller handles boiling liquids with low submergence. Capacities range from 60° to 3900 g.p.m. at heads up to 700 ft., temperatures up to 850°F., pressures up to 550 lb.

Type WH. High-pressure, high-temperature, centrifugal hot-charge pumps. Twelve distinct points of superiority, based on years of experience building pumps for high pressures and temperatures. Capacities to 2000 g.p.m., heads to 5000 ft.

Type HL. Several construction arrangements permit flexibility in application. Designed for temperatures up to 925°F., or higher with water-jacketed stuffing box. Capacities up to 1600 g.p.m., heads to 500 ft.

The HIGHER THE TEMPERATURE . . . the LESS WEAR on the Cylinder Wall!

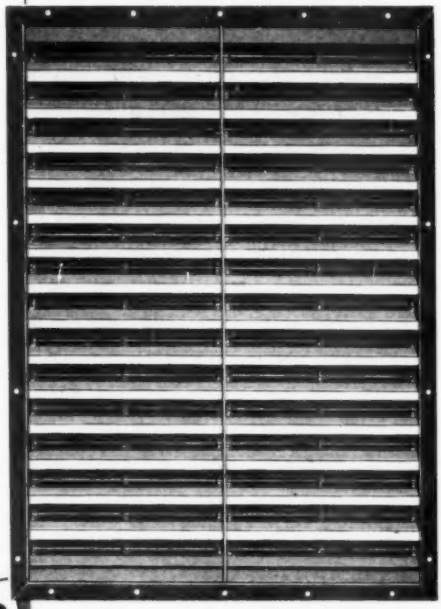


STUDY THIS SAE CHART

As is commonly known, the higher the temperature, the less amount of wear on the cylinder wall. Uniform high heat is also beneficial to an engine otherwise, adding power, economy and longer life, and preventing sludge!

KYSOR SHUTTERS

Control Temperature!



8%-12% MORE FUEL SAVING

Less Oil Consumption

Fewer Breakdowns

Kysor Shutters are TEMPERATURE CONTROLLED—maintaining the proper temperature at all times by means of automatic air or vacuum controls. They afford positive protection within 8 or 10 degrees! Install a Kysor shutter on that new or old engine, or specify it from your manufacturer. *It will soon pay for itself in recognizable greater efficiency.*

Write for bulletin!

"Built to Last"

KYSOR HEATER COMPANY Cadillac, Michigan

CANADIAN REPRESENTATIVES... RAILWAY & POWER ENGINEERING CORP.

NEW GLASGOW · MONTREAL · NORANDA · NORTH BAY · TORONTO · HAMILTON · WINDSOR · WINNIPEG · EDMONTON · VANCOUVER

MAGCOBAR FIBER-SEAL

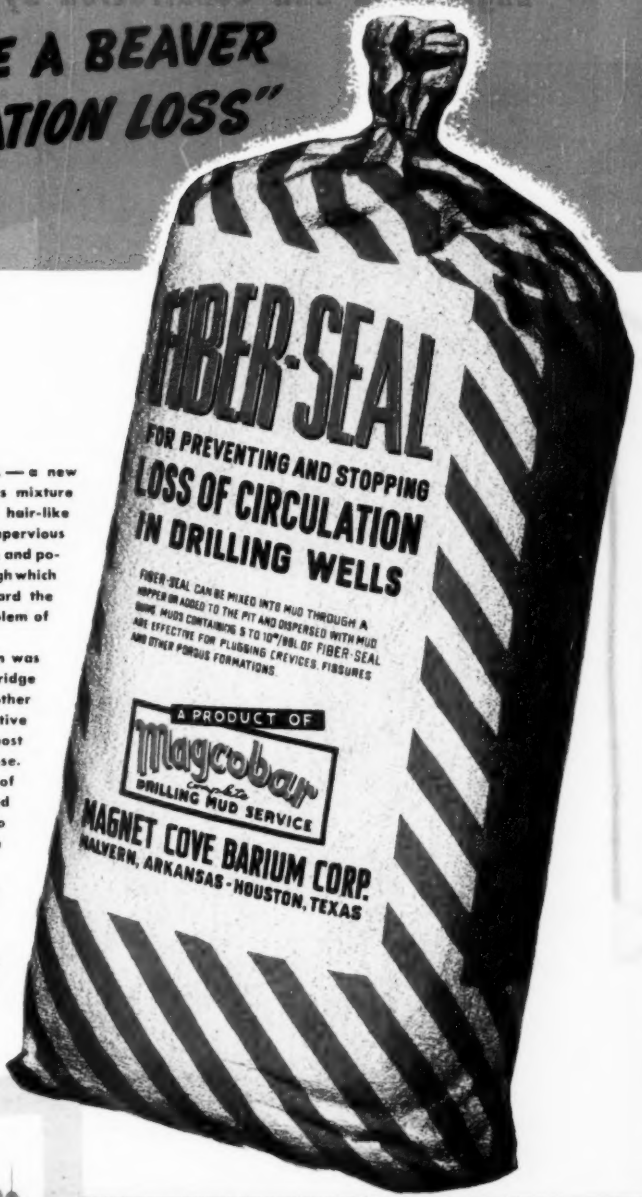
"IT WORKS LIKE A BEAVER TO STOP CIRCULATION LOSS"

Magcobar FIBER-SEAL — a new and improved fibrous mixture containing strong hair-like fibers that build an impervious mat in fissures, cracks and porous formations through which mud will not pass—is a major contribution toward the ultimate solution of the hazardous and costly problem of *lost circulation.*

In developing FIBER-SEAL, the first consideration was to find a material that would form an impervious bridge in large openings and yet not foul the valves and other working parts of the circulating pumps. Exhaustive field tests indicate that FIBER-SEAL is by far the most desirable material developed to date for this purpose.

FIBER-SEAL is loosely packed in paper bags of convenient size for easy handling. It may be added through the hopper or directly to the mud pit. No hand fluffing is necessary. A few sacks will often stop mud loss promptly.

Keep 20 sacks on hand at the rig. It is cheap insurance against loss of rig time and expensive mud!


FIBER-SEAL
FOR PREVENTING AND STOPPING
LOSS OF CIRCULATION
IN DRILLING WELLS
FIBER-SEAL CAN BE MIXED INTO MUD THROUGH A HOPPER OR ADDED TO THE PIT AND DISPERSED WITH MUD GUNS. MUDS CONTAINING 5 TO 10 #/BBL OF FIBER-SEAL ARE EFFECTIVE FOR PLUGGING CREVICES, FISSURES AND OTHER POROUS FORMATIONS.
A PRODUCT OF
Magcobar
DRILLING MUD SERVICE
MAGNET COVE BARIUM CORP.
MALVERN, ARKANSAS - HOUSTON, TEXAS

MAGNET COVE BARIUM CORP.
MALVERN, ARK. HOUSTON, TEXAS
Export Representative: DANIELS, BECKLEY & ASSOCIATES
30 Rockefeller Plaza, New York 20, N. Y.

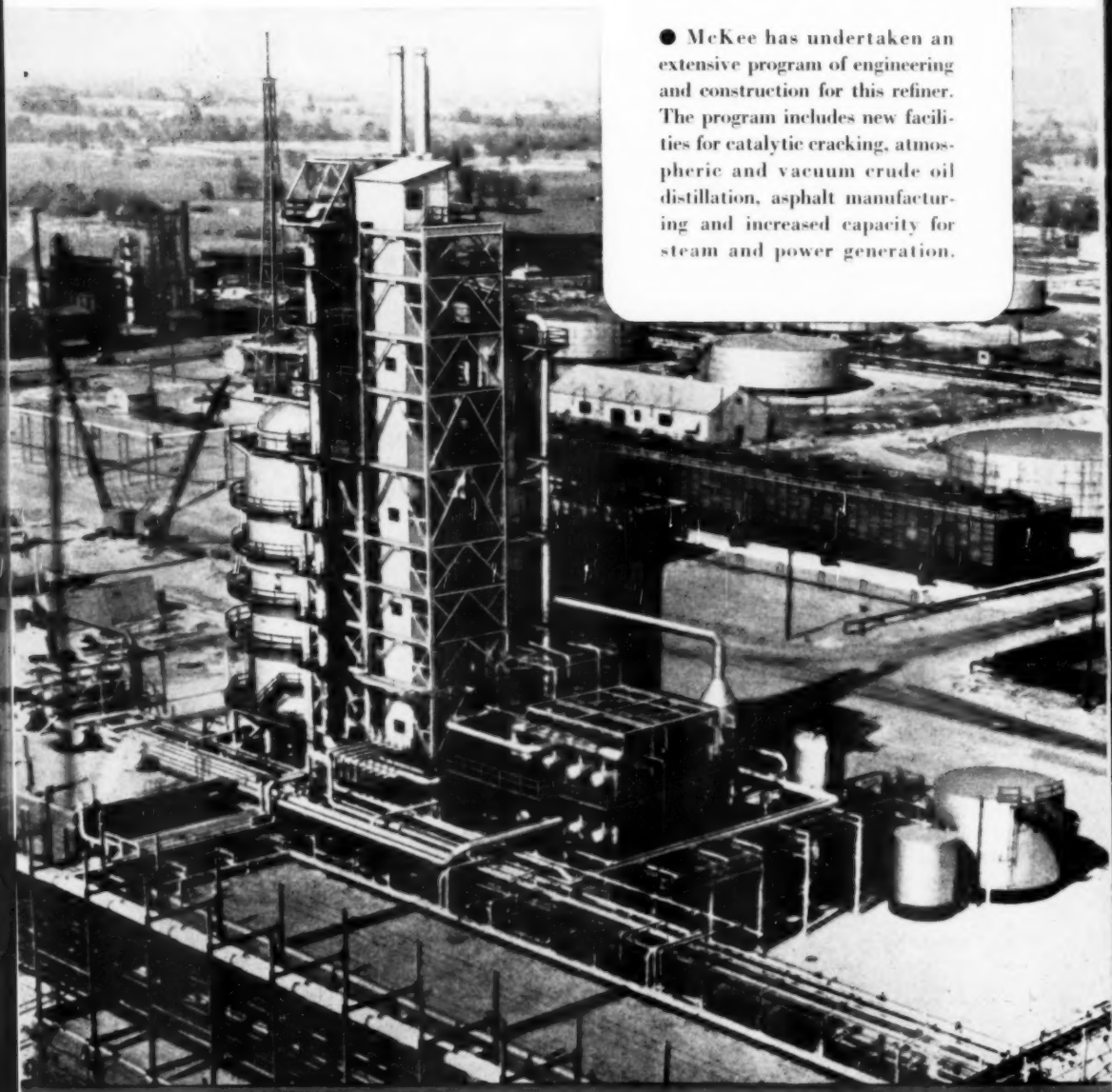
Magcobar
Complete
DRILLING MUD SERVICE
DEALER

Look for this sign **WHEN YOU NEED MUD**

MAGCOBAR • MAGCOGEL • HIGH YIELD DRILLING MUD • XACT CLAY • FIBER-SEAL • MAGCO-MICA • TANNATHIN • JEL-OIL MUD • JEL-OIL "E" • SALT GEL • NOHEEV • SEAL FLAKES • MY-LO-JEL • CHEMICALS

NEW CATALYTIC CRACKING UNIT

Engineered and Constructed by McKEE



● McKee has undertaken an extensive program of engineering and construction for this refiner. The program includes new facilities for catalytic cracking, atmospheric and vacuum crude oil distillation, asphalt manufacturing and increased capacity for steam and power generation.

ARTHUR G. McKEE & COMPANY

DESIGN, ENGINEERING AND CONSTRUCTION FOR THE PETROLEUM REFINING AND IRON AND STEEL INDUSTRIES

ENGINEERS AND CONTRACTORS • ESTABLISHED 1905
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30 Rockefeller Plaza, New York, N. Y.

Champion Slush Pit Hose is constructed with a thick, abrasion-resisting tube, heavy close-spaced wire reinforcement, and multiple plies of heavy duty duck. Weather and abrasion resisting cover.

Pioneers in **COLD RUBBER**

Champion Slush Pit Suction Hose for dependable oil well drilling

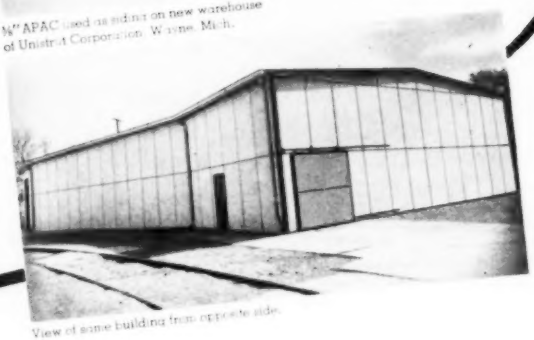
Champion Slush Pit Suction Hose pays for itself many times over by increasing pump life and reducing maintenance costs and down-time. Champion qualities have been proven in thorough-going tests on all types of drilling equipment and under the toughest of modern drilling conditions. Get in touch with your distributor for detailed information.

MECHANICAL RUBBER GOODS BY
REPUBLIC RUBBER DIVISION

REPUBLIC RUBBER DIVISION
LEE RUBBER & TIRE CORPORATION . . YOUNGSTOWN, OHIO
Lee Deluxe Tires & Tubes . . Conshohocken, Pa.

OUTSIDE AND INSIDE, TOO... IT'S K&M "Century" APAC

⅜" APAC used as siding on new warehouse of Unistrut Corporation, Wayne, Mich.



View of same building from opposite side.

In this new building of the Unistrut Corporation, Wayne, Mich., "Century" APAC asbestos-cement sheets were used both for siding and interior walls . . . where they can be counted on for a long life-time of dependable service.

"Century" APAC is the ideal material for industrial buildings of many kinds . . . both in new construction and remodeling. It is economical to use . . . easy to handle and apply, so goes up fast. It requires no protective paint, and maintenance is at a minimum. In fact, APAC actually grows tougher with age.

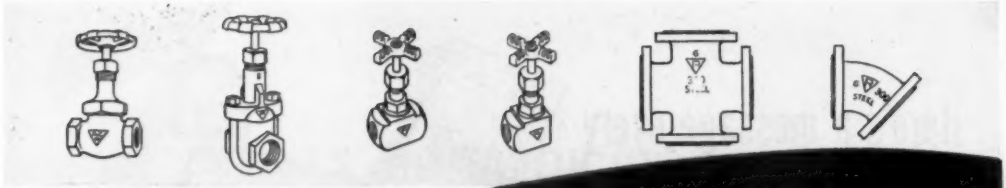
In addition to its use as siding and interior walls, APAC is extensively used for ceilings, office paneling, partitions, sheathing in machine shops and stock rooms, elevator shaft casings, storage bins and other flat surface applications.

Being made of asbestos and cement, APAC is fire resistant and proof against weather, rust, corrosion, rot, rodents and termites. It can be applied over insulation board, wood studs, solid wood sheathing, steel or wood girts. APAC is furnished in thicknesses of $\frac{3}{16}$", $\frac{1}{4}$" and $\frac{3}{8}$". Standard size sheet is 4' x 8', but cutting to size is simple—just score and snap off.

Write for name of nearest distributor and further particulars. Your inquiry will receive prompt attention.

Nature made Asbestos . . . Keasbey & Mattison has made it serve mankind since 1873.

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA



R-P & C HEAVY-DUTY BRONZE GLOBE VALVE

FOR TOUGH THROTTLING CONDITIONS

500 BRINELL DISC AND SEAT

- **STEM** high tensile rolled bronze. Large diameter and long thread contact.
- **PACKING NUT** and gland follower of heavy bronze transmit even pressure onto packing.
- **STUFFING BOX** large and deep. Packed with formed rings of braided asbestos, lubricated and graphited. Can be repacked under pressure.
- **UNION NUT** heavy, rugged. Facilitates removal and replacement without danger of distorting body or threads.
- **BEVELED JOINT** permits tighter union between body and bonnet.
- **DISC LOCK-NUT** holds disc securely to end of stem.
- **FULL-PLUG DISC and SEAT RING** stainless steel of 500 Brinell—near diamond—hardness.
- **BODY** P & C High Test Bronze. Reinforcing ribs give added strength. Heavy end hexes with standard, full length threads.

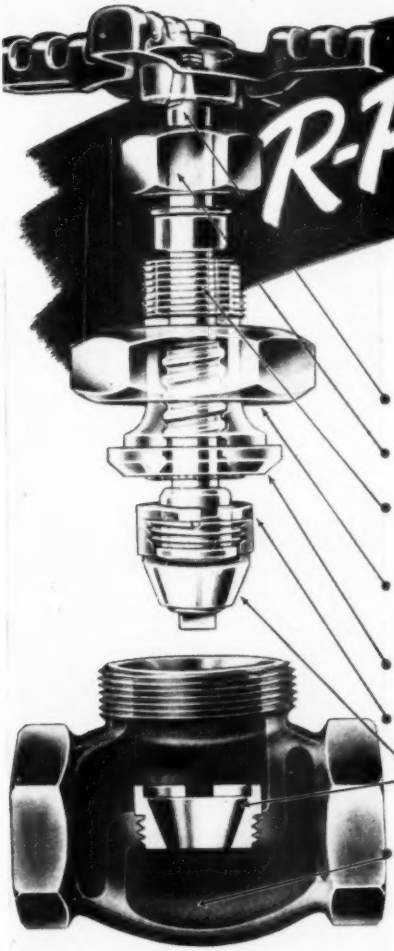
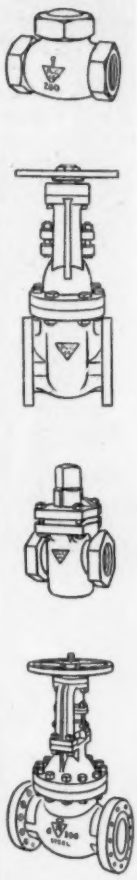


Fig. 531-P

350 lbs. Steam • 1000 lbs. OWG



Send **FOR THIS FOLDER** *which contains a detailed description of this valve. Ask for* **DH-116**

ACCO

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New York • Philadelphia • Pittsburgh • San Francisco • Bridgeport, Conn.

R-P & C VALVE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

READING-PRATT & CADY VALVES

Here's a message every OIL MAN can read . . . profitably!

NATURALLY, you want to be successful. You want to make money. And what better way is there to *make* money than to save money on your truck transportation?

You can save *plenty* of money with trucks that fit your job . . . Dodge "*Job-Rated*" trucks.

It stands to reason: if a truck's too big for your job, you'll waste money; if it's too small, you'll pay plenty for costly maintenance.

From 248 basic chassis models, your Dodge dealer can specify a truck that will be "*Job-Rated*" exactly for your hauling job.

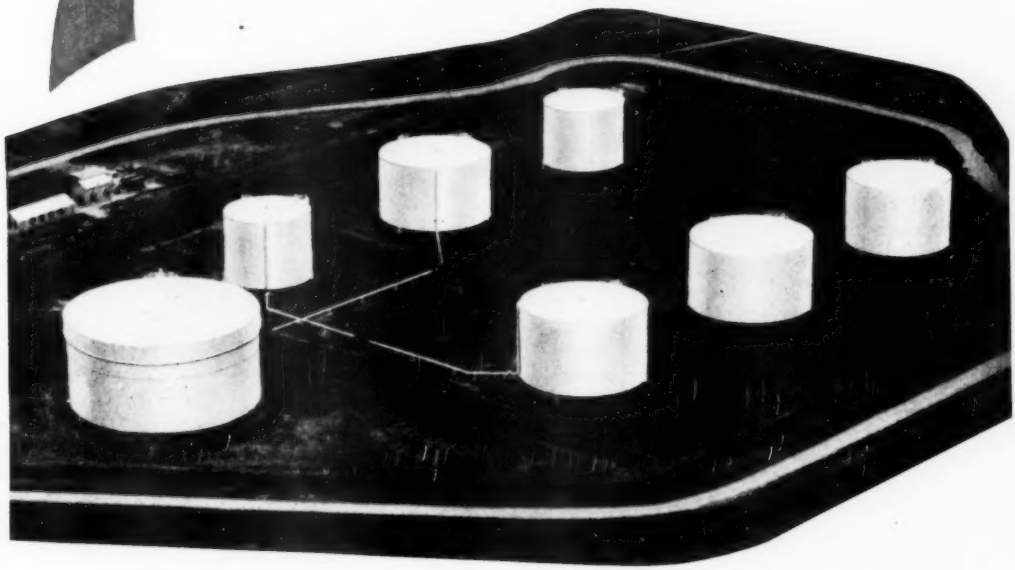
Such a truck will have the right one of 7 "*Job-Rated*" truck engines . . . "*Job-Rated*" for top efficiency and maximum economy. It will have the right chassis units throughout . . . "*Job-Rated*" to haul *your* loads, over *your* roads. Your truck will last longer . . . save money every mile it's driven.

So have a talk with your Dodge dealer. For remember . . . *only* Dodge builds "*Job-Rated*" trucks!

For the good of your business—

Switch to DODGE "Job-Rated" TRUCKS

7 POINTS IN FAVOR OF GRAVER EXPANSION ROOF TANKS



Make a point-by-point comparison and you will be convinced that the Graver Expansion Roof Tank is ahead on any score. For example:

■ ***Positive Action*** . . . Patented design permits roof to rise or descend in a straight up and down motion as vapors expand or contract.

■ ***Tank Settlement*** . . . All tanks settle—but the normal unequal settlement will not affect the operation of the Graver Expansion Roof.

■ ***Stabilizer*** . . . Exclusive Graver feature assures peak operating efficiency even with an unbalanced load.

■ ***Maintenance*** . . . Lowest cost—less than any other tank designed for this type of service!

■ ***Liquid Seal*** . . . Protected liquid seal prevents escape of valuable vapors. Nothing to dope or patch; nothing to break, tear, or wear out.

■ ***Gauging*** . . . Because of the straight up and down motion of the Graver roof, gauging of the tank always takes place at the same point and accuracy is assured.

■ ***Multiple Installation*** . . . Where more than one Graver Expansion Roof is required in the same system, the full capacity of every one can be used. No vapors vented till *all* roofs reach full height.

Now . . . get the whole story. Make sure you are familiar with every feature of the Graver Expansion Roof Tank. Ask for full details today.

GRAVER

FABRICATED PLATE DIVISION

GRAVER TANK & MFG. CO., INC.

EAST CHICAGO, INDIANA

NEW YORK • PHILADELPHIA • CHICAGO • CATASAUQUA, PA. • HOUSTON • SAND SPRINGS, OKLA.

Here it is—the Inside story of

PORTER *Lubricated* PLUG VALVES

A—SCREW PISTON for loading stick lubricant
B—LUBRICATION BARREL threaded into top of plug shank
C—GLAND NUT
D—GLAND
E—CHECK VALVE prevents return of lubricant when renewing stick lubricant
F—COLLAR, main bearing in close sealing contact with top face of plug by packing N under compression
H—TOP FACE of PLUG
I—LUBE GROOVE
J—PLUG LAPPED to BODY in manufacture assures perfect leak-proof fit.
K—LUBE GROOVE
L—LUBRICANT CHAMBER. Under pressure from screw piston A, lubricant creates an upward force during lubrication tending to free plug for easy turning
L—PIN prevents collar F from turning, but permits vertical movements under pressure from resilient packing N. Pin also limits plug to quarter turn and accurately positions it open or closed.
M—O-RING, under initial compression, for extra protection against leakage past shank.
N—RESILIENT PACKING completely enclosed in non-rotating metal parts. Resiliency of packing tends to seat the plug tightly in body.
O—Two LUBE PASSAGES from center lubricant chamber.
P—Two VERTICAL LUBE GROOVES, 180° apart. When plug is given a quarter turn, neither of these grooves passes a port
Q—Two SHORT LUBE GROOVES leading to lubricant chamber

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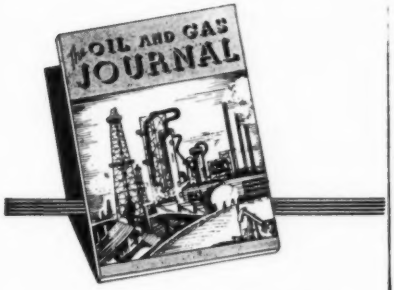

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JOURNALLY Speaking

Missing Persons Bureau

OUR Reader Service Department does its best to answer questions from subscribers, but it was of no help to a Texas lady who wrote for information on the whereabouts of her father who walked out of the house 10 years ago without leaving a forwarding address. Since he was an oil man, the lady figured, with sound reasoning, that the world's greatest oil publication might know something about him.

Sadly the R.S.D. had to reply that the missing pater must be no longer in the land of the living, figuring, with equally sound reasoning, that while an oil man might desert his family he would never stop subscribing to the Journal and if he were alive his name would still be on the circulation list.

What Octane Race?

THE supposed rush toward higher and higher octane ratings of motor fuel, which was said to have had all refiners in a dither ever since the end of the war, is getting a setback on the West Coast this summer.

General Petroleum Corp. is running a series of newspaper ads advising motorists not to buy General's higher-priced, premium-grade gasoline unless they are sure their engines specifically require it. Dealers are being told that not more than 20 or 30 per cent of all cars on the road today can benefit from premium gasoline, and the others are wasting money in using it.

Gosh, what's the advertising business coming to?

No Plutocrat

OUR circulation department recently received a letter from General Bussan Kaisha, Ltd., in Japan stating "we wish to advise that Mitsui Bussan Kaisha, which has subscripted to The Oil and Gas Journal has been extinguished due to the liquidation of the plutocrats in Japan as you know. In view of our intimate relations that our company consists mostly of former Mitsui members, we are to obtain the rights of quota for subscription from Mitsui under the negotiation between us."

With this assurance of the absence of plutocratic tinge, our circulation manager, who is a thoroughly democratic fellow, permitted the new firm to be "subscripted." No plutocrat, he.

Round Up on the Range

THE American Gas Association is sponsoring a National Old Stove Round Up in an attempt to corral obsolete ranges and replace them with shiny modern appliances burning you know what fuel. The ranch-and-covered-wagon motif is being worked to the limit as a sales device, which may increase the market for gas but must disturb the eternal sleep of old-time buckaroos whose chuck-wagon meals were cooked over mesquite branches and buffalo chips. Bring me my boots and satchel.

Luxury Cruise

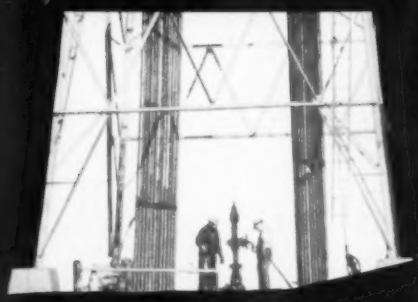
SHADES of Captain Bligh! The men who go down to the sea in ships these days must be a bunch of softies, at least if they go on tankers.

Comes now an announcement from Sun Oil Co. that its tanker crews are shown movies for entertainment while at sea. And—this is the payoff—much of the cost is defrayed by the sale of soft drinks aboard.

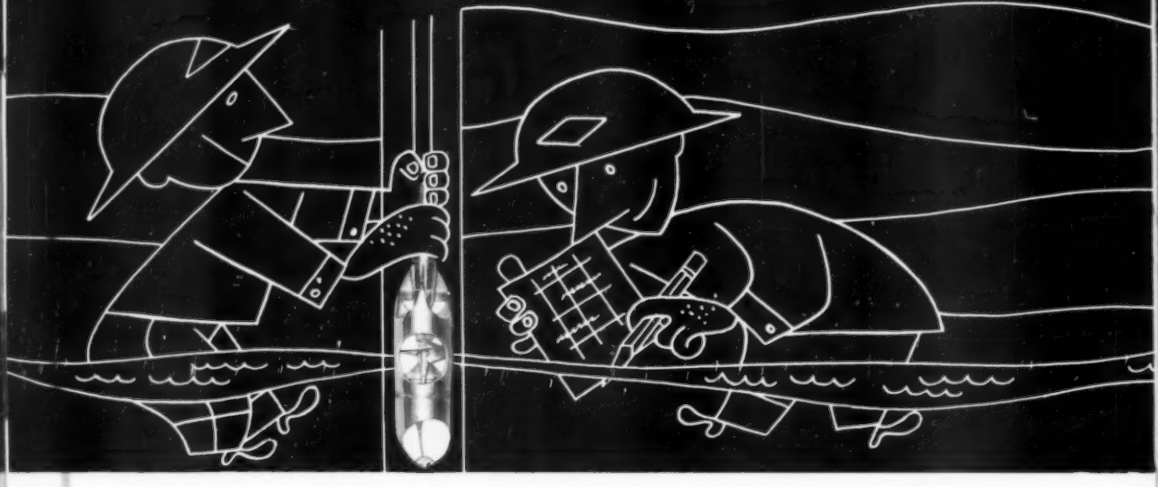
Ye gods! It doesn't seem so long ago that the conductor of this department was a crewman on a tanker. There wasn't a thing on board to buy, the only amusement was sun bathing, and we were thankful that one spigot near the cook's refrigerator yielded a driblet of reasonably cool water.

Wonder if the modern tankers serve tea with lemon on the poop deck every afternoon, with a midnight snack for the 8-to-12 watch. We should have stayed at sea instead of becoming an ink slinger. No, son, times ain't like what they used to be; now when I was a boy . . .

—Henry D. Ralph



Get the Low Down on Fluid Flow!



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Stop Trouble before it starts...

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BAKWIK SAVES MONEY FOR YOU because it—PREVENTS PLUGGING THE BIT with the danger, lost time, and the annoyance of pulling wet strings—RELIEVES WEIGHT ON DERRICK and other rig equipment because it "floats" the drilling string—LENGTHENS LIFE OF WIRE LINES AND BRAKE BANDS due to the reduced weight of the drilling string, which is "floated" in—DOES NOT INTERFERE WITH DRILLING because the valve can be quickly lifted out of the string and just as easily replaced. And BAKWIK is an "Ace in the Hole" to MINIMIZE OR PREVENT SERIOUS DAMAGE in event the drilling string should part while running-in or coming-out of the hole.

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The strong, simple valve assembly is made entirely without threads and is merely dropped into place by hand. No tools or wrenches are required to install or remove. When an unrestricted passageway is desired, the valve assembly is lifted out, and surveying instruments, or other devices can be run through the drill pipe.

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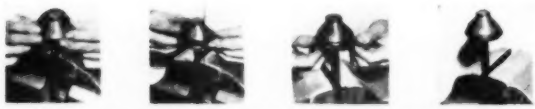
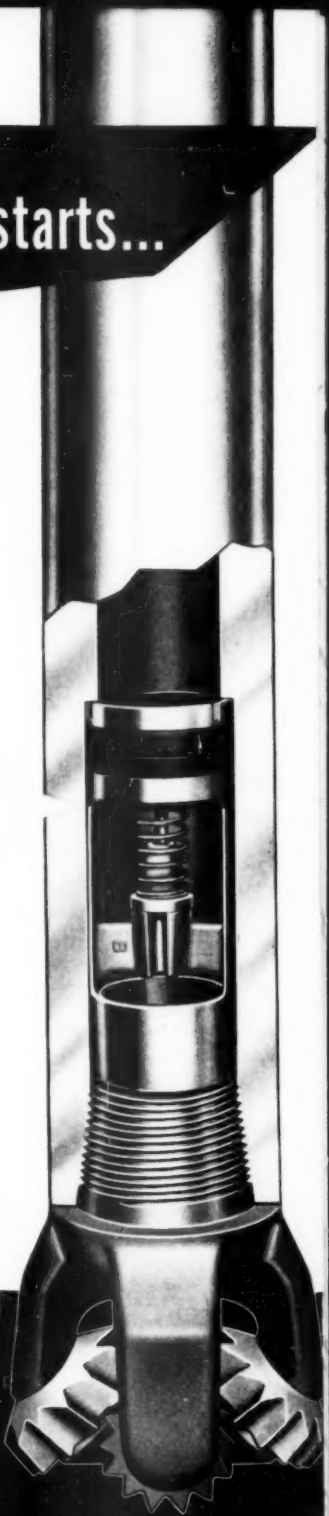


To install new Valve Seal—after long service—in less time than it takes to tell it, you merely (1) press small portion of valve seal down to fit matching groove in valve head; then (2) pull rest of seal parallel to upper edge of groove; (3) pull seal just below groove; press small section at a time into groove. Roll on bench, applying pressure, until the seal fits perfectly as in view (4).



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THE OIL AND GAS JOURNAL

Methane to Coke

THIS year so far has brought several contractions in petroleum operations but in two increasingly important related activities it has not. While domestic producers of crude oil have reduced production about 6.5 per cent this year compared to the same period in 1948, natural-gas output has increased as reflected in the 8.5 per cent gain in sales by utility distributors. Operators of 380 refineries in this country started reducing their crude runs to stills at the start of the year and they are now 10 per cent under August last year. But the light-hydrocarbon output of several hundred natural-gasoline plants and cycling plants has expanded several per cent.

The end in the rapidly widening demands for natural gas which will shortly cover a large part of the urban area from New England to the West Coast, is not in sight. So great is the public demand for this fuel that opposition to expansion from railroads, coal interests, and sections of organized labor, formerly effective, is futile and has largely disappeared.

On the supply side additions to new natural-gas reserves exceed the marketed output. At this point the same conditions which are important in natural-gas growth are also controlling in the production of light hydrocarbons. The application of conservation rules is ending the flaring of gas and other wasteful practices. This accounts in part for the construction of a number of natural-gasoline and cycling plants the past 3 years which have greatly increased the manufacture of light hydrocarbons and have provided part of the enlarged supply of natural gas.

Marketwise there is plenty of evidence of what the enlarged output of natural gas means. It competes not only with coal but with residuel fuel oil and with furnace oil and other products of the refineries. It occupies a strong competitive price position in relation to other fuels at most points. To a lesser degree the liquefied gases of the gasoline plants are also a competitor of the fuel products of refineries.

A gallon of natural gasoline is the same as a gallon of refinery gasoline so far as the motor-fuel market is concerned. A ready market must be found for the additional natural gasoline that is to be produced or it will become a bearish factor affecting the entire motor-fuel market.

We do not mean to convey the thought that the expanded production of natural gas, natural gasoline, and other light hydrocarbons has offset the good that has been accomplished in curtailing crude production and refinery operations. In volume and B.t.u. equivalents the curtailments exceed the increased output of these two classes of products.

But we do want to emphasize that the hydrocarbon market of today is gaseous, liquid, and solid, and in petroleum extends from the methane of the gas to the coke byproduct of the refinery operation. A realization now that this whole apple must be considered and not part will forestall many headaches for the entire oil industry in the future.

Low Tanker Rates Increase World Competition of Middle East Oil

by Dahl M. Duff

Changing conditions in the world oil markets are explained in this article by a Journal staff writer, which shows how postwar reductions in tanker rates, together with a lowered price of Persian Gulf crude, permits Middle East oil to undersell comparable crude from the Caribbean and the Gulf of Mexico in the refining centers of Western Europe, and also makes it competitive in the United States.

Prices are based on current quotations for a single gravity of crude and do not take into consideration other characteristics of the various crudes, possible fluctuations in tanker rates, nor other factors affecting competition and which change from time to time.

NEW YORK.—The recently lowered price of Persian Gulf crude oil and the reduction in tanker rates which has taken place during the past few months have combined to make it possible for Middle East oil to enter North Atlantic ports of the United States, duty paid, at a price virtually competitive with Texas crude.

Middle East oil already has a distinct price advantage in Europe over both Texas and Venezuelan crude. The same is true in the southern part of South America.

Most Middle East oil imported into the United States to date has been consigned to refineries of companies owning the production, so there is no established price for it. However, the quoted price for such crude for delivery in Europe is now $1.82 per barrel for crude of 33° gravity, f.o.b. tanker in Persian Gulf ports.

Using this figure as the price, Middle East oil can now be landed in Atlantic Coast ports for $3.13 per barrel after paying the import duty of 10½ cents per barrel and tanker charges of $1.20 per barrel which include Suez Canal tolls of 18 cents per barrel.

West Texas crude of comparable gravity costs around $2.95 per barrel in North Atlantic ports. Venezuelan crude can be landed for $2.98 per barrel, duty paid.

Pipe Lines to Lower Costs

The price of $1.82 f.o.b. Persian Gulf is probably somewhat arbitrary. Actual production costs are not known, but it is generally believed that crude could be sold for a considerably lower figure and still yield a profit, at least from some of the Middle East fields. When the large pipe lines now under construction are completed from Arabia, Kuwait, and Iraq to the eastern end of the Mediterranean Sea the tanker haul will be much less and Suez Canal tolls will be eliminated, so that Middle East crude will have a much greater price advantage.

The advantage already held by Persian Gulf crude oil in the markets of Europe and parts of South America is emphasized when current f.o.b. selling prices are correlated with tanker transportation charges.

The laid-down cost of Persian Gulf crude of 33° gravity in Southampton, England, is about $2.84 a barrel. This compares with $3.38 for oil of the same gravity from West Texas and with $3.21 for Eastern Venezuelan crude shipped from Puerto la Cruz.

The information indicates that the same Persian Gulf crude can be delivered in Buenos Aires, Argentina, for $3.08. Venezuelan oil from Puerto la Cruz would cost approximately $3.23.

These figures reflect oil selling prices at the port plus what is considered to be a reasonable transportation cost based, in the case of foreign hauls, on 70 per cent of the U. S. Maritime Commission rate.

They obviously do not take into account a number of other considerations which enter into any economic consideration of the world-wide petroleum trade. Some of these are rather intangible and difficult to assess on a dollars-and-cents basis. The relative general level of delivered prices can, however, be illustrated by selling-price and transportation figures.

Tanker Rates Low

The cost of tanker movement is a controlling factor in determining the limits of the competitive market area for the various sources of crude supply. At the present time, the open charter market for tankers is in an extremely depressed condition, and some fixtures have been made as low as 55 per cent below the former U. S. Maritime Commission rates.

These USMC rates lost their official stature a year or so ago when the commission disposed of its remaining vessels, but they continue in use in the chartering market as a convenient yardstick or base for rate determination. A percentage variation from USMC is used to reflect current conditions. The British have a parallel rate base which was promulgated by the Ministry of Transport.

The USMC rates were considered by some to be somewhat high when they were set up during the war. The shortage of ships after the war and the withdrawal of commission vessels from service caused open-market chartering rates to move sharply upward, and in the winter before last some fixtures were made at up to 250 per cent of USMC.

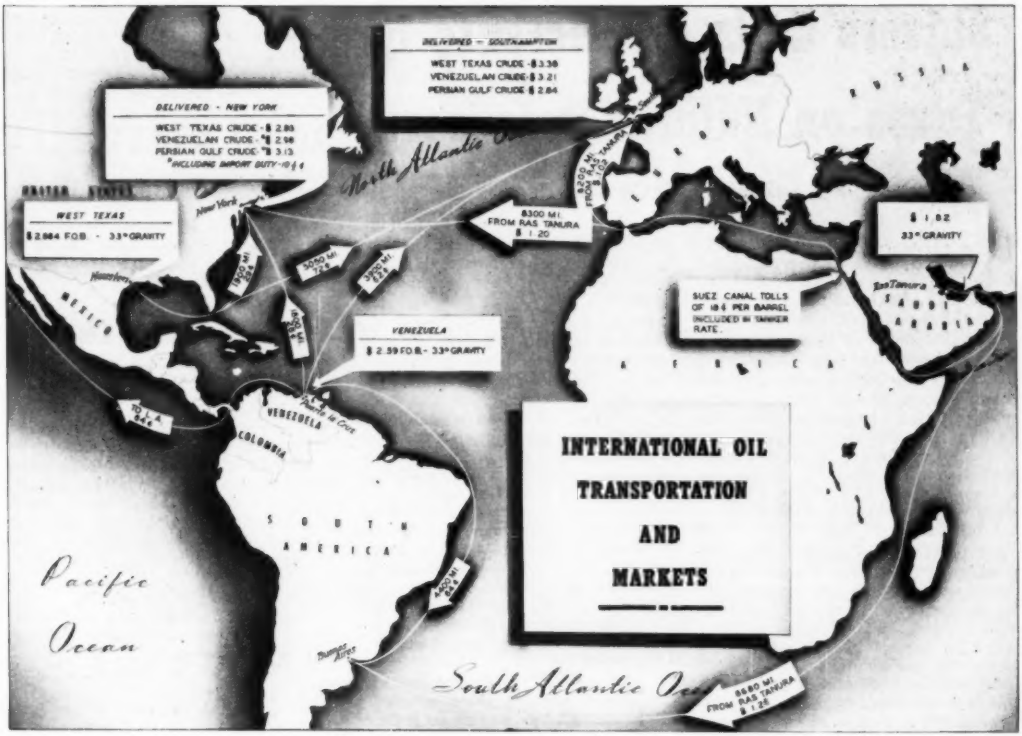
The drastic slump in the tanker market began late last year as a result of the improved supply of ships, including foreign, and the more stabilized demand for petroleum in many areas of the world. This decline in tanker rates probably has been the most spectacular of any price suffering a reaction from postwar inflation.

Rates Vary Widely

While single-voyage charters can now be made at 50 per cent and below USMC, this can hardly be considered representative of the long-term outlook or of the costs of a major fleet owner. Vessels time-chartered last year continue in service, and a tanker-company fleet will include ships of varying ages and efficiencies, along with charters made under varying market conditions.

The operator of one relatively small American-flag fleet expressed the opinion that, considering the present price of bunkers, a rate 30 per cent off USMC would allow him to meet costs and make a fair return. Such a figure would, of course, vary widely from fleet to fleet. The foreign-flag operator has a lower break-even point. M. G. Gamble, marine manager of Standard Oil Co. (N.J.), told a Senate committee recently that foreign tankers operate 25 per cent under United States vessels, 90 per cent of which is attributable to wages.

American-flag ships are required on the coastal routes, but elsewhere much American tonnage has been eliminated by its higher costs and the current low open-market rates. A



This map shows distance and per-barrel tanker charge on some of the principal routes. Also listed are f.o.b. prices for 33°-gravity crude oil in the three principal export areas

number of ships have been laid up, and more are expected to go out of service, barring improvement in the market.

A recent study of the costs of moving Persian Gulf oil to the East Coast of the United States listed $1.28 for a United States vessel, $1.12 for Panamanian, $1.03 for British and $1.02 for Norwegian. It is based on the use of a T-2 tanker purchased from the Maritime Commission for $1,800,000 and making 6.2 trips a year. The per-barrel rates include depreciation and interest but do not allow any profit on investment or risk to the operator.

Operating Costs Analyzed

In this case, wages, overhead, insurance, payroll taxes, stores, repairs, and similar items came to $427,000 annually for the United States ship, $310,000 for the Panamanian, $249,000 for the British, and $240,000 for the Norwegian. Other operating costs common to all were $298,000, including canal tolls. For a 26,000-ton tanker of the new type now going into service, the per-barrel costs, Persian Gulf to the East Coast, were United States $1.20, Panamanian $1.11, British $1.03, and Norwegian $1.03. These ships are considerably more efficient, but this is offset by the fact that a war-surplus T-2 was purchased at less than replacement cost.

These figures when taken together with a return for the tanker operator, would further indicate that 70 per cent of USMC, or 30 per cent off the commission rates, represents a reasonable approximation of transportation charges.

The accompanying map shows the tanker charge per barrel on several of the principal routes and also the price of 33° gravity crude at the port in three major supply points—Persian Gulf, Venezuela, and Texas Gulf Coast. Except for the Gulf Coast-New York run, tanker charges are 30 per cent off USMC, converted to 33° gravity. For the Persian Gulf, Ras Tanura was used as the origin; rates for Abadan are slightly higher. Twenty-five per cent off USMC was used in the case of the Gulf Coast-New York run to give effect to the higher costs of the American ships. Twenty-five per cent off also was used for the Western Venezuela-Los Angeles run.

The following table shows data for some of the other routes, using T-2 tankers. It gives the USMC rate or equivalent per ton, 70 per cent of this per barrel of 33° gravity oil, and the voyage time. Routes through Suez and Panama include canal tolls.

Route	70 per cent USMC for 33° gravity per ton	Days steaming one way
Haifa-New York	$ 7.80 $0.73	14.47
Tampico-New York	2.95 .28	5.54
Haifa-Southampton	5.45 .38	8.72
Abadan-Southampton	11.60 1.09	17.71
Houston-Buenos Aires	9.70 .91	17.78
San Pedro-Buenos Aires	11.35 1.07	20.13
Abadan-Montreal	13.40 1.26	23.38
Talara-Montreal	6.80 .64	11.25
Houston-Naples	8.75 .82	15.96
Haifa-Naples	2.80 .26	3.29
Aruba-Rio de Janeiro	5.50 .52	10.04

When tanker rates on this 30 per cent-off basis are used with crude selling prices, the results in terms of laid-down costs back up the favorable position held by Middle East oil in Europe. This also applies to a South American market distant from Venezuela, such as Argentina. The advantage would be even more apparent in the case of Middle East oil to eastern Africa and southwest Asia. Much of the f.o.b. price disparity favoring Persian Gulf crude is taken up in transportation costs when this crude is laid down in North America and other areas of South America.

A number of other factors influenc-

(Continued on page 142)

Shivers Calls for Increase in Taxes on Natural Resources

by Leigh S. McCaslin, Jr.

HOUSTON.—Gov. Allan Shivers, in his first public policy statement since inauguration, suggested last week that additional taxes be levied on "natural resources" when the Texas Legislature meets in January.

Natural resources means oil, natural gas, and sulfur in Texas. A crude-oil production tax of 4.125 per cent of the market value already furnishes the bulk of the general revenue of the state. Natural gas is taxed at 5.2 per cent of market value and sulfur has a levy of $1.27 per long ton. These rates were established in the omnibus tax bill passed in 1941.

Governor Shivers suggested upward revision of these rates during the recently concluded session of the legislature. Hence, it is presumed that his policy speech of last week was hinting at an increase in tax rates as prescribed by the omnibus bill.

The omnibus bill taxes a number of things other than oil, gas, and sulfur; however, these three natural resources raise the major portion of the revenue obtained. During the 1948-49 fiscal year, the crude-oil production tax raised $90,650,000, and the natural-gas tax brought in $8,500,000. The state comptroller estimates that these respective amounts will be $83,300,000 and $8,750,000 for the 1949-50 fiscal year.

10 Per Cent Hike Seen

Many close observers of the legislature believe that the bill most likely to receive the administration's support will be one calling for a flat 10 per cent increase in omnibus-bill tax rates. This would have the effect of raising the tax on oil production from 4.125 per cent of value to 4.5375 per cent of value; sulfur from $1.272 to $1.3992 per long ton; gas-production taxes from 5.2 per cent of market value to 5.72 per cent; and on gas utilities, for towns of 1,000-2,500 population, a raise from 0.44 to 0.484 per cent of gross receipts, for 2,500 to 10,000 population, a raise from 0.81 to 0.891 per cent, and for towns over 10,000 from 1.5125 to 1.66375 per cent.

Shivers admitted in his speech that natural resources are already supplying a "considerable portion" of the state's income, but added that "they can stand some additional tax burden." He also stated that "the time is rapidly approaching when these sources will have been fully exploited. Then, if the present rate of state spending continues and the demands for state services keep mounting, additional sources of revenue must be found."

While asking for new taxes, the governor injected a statement warning against overspending. He told Texans: "In recognition of changing business conditions, with the possibility before us of an economic recession, it is imperative that the taxation plan arising out of the eleemosynary emergency must not be allowed to expand and convert itself into a more liberal permanent policy of bigger spending and more taxes. Our spending policies are already liberal enough—some will say, too liberal. This is certainly not the time for further liberalization, or for any additional expenditures except in those fields where necessity is inescapable."

Revenue Down

Although Shivers spoke primarily of the $17,000,000 needed to finance eleemosynary institutions, some observers believe other money may have to be raised because of declining revenue from oil-production taxes. Starting last January, the Railroad Commission has ordered seven consecutive cutbacks in Texas crude production. These cuts total around 965,000 bbl., or equivalent of 40 per cent of the state's production on January 1 when the cuts were started. As a result of these allowable slashes, May receipts of production taxes were $6,215,160—$2,200,000 below last December. For July, the decline is estimated at about $3,000,000 for the month. It is possible new taxes will have to be levied to compensate for this very considerable loss of revenue.

A number of tax bills, other than the 10 per cent increase in the omnibus rates, were introduced in the last session of the legislature. These may provide a clue as to possible tax measures in January. Rep. C. S. McClellan called for a production tax of 1 per cent per 1,000 cu. ft. on natural gas, and Rep. Deno Tufares asked for a levy of 1½ cents per 1,000 cu. ft. of gas at the well head. A bill repealing the state's 4-cent-a-gallon retail gasoline tax and substituting a 1-cent-a-gallon processing tax on all combustible fuels was filed by Rep. Davis Clifton.

House Bill 827 by Rep. Cloyd Young provided for a sliding-scale levy on oil production with graduations ranging from 1.5 to 8 per cent of market value. The lower limit would be for concerns or individuals having production of less than 1,000 bbl. per month, while the upper limit would be for those producing 6,000,000 bbl. per month or more. A sliding-scale levy on gas gathering was also proposed. This bill called for a tax of 1.5 cents per 1,000 cu. ft. for gas sold at not more than 5 cents per 1,000 cu. ft.; 2 cents in the 5-8 cents per 1,000 cu. ft. bracket; 2.5 cents for 8-10 cents price; and a ½-cent increase for each 4-cent increase in price above 10 cents per 1,000 cu. ft.

Jersey Standard Halts Middle East Imports

STANDARD OIL CO. (N. J.) announced this week it has halted all imports of Middle East crude oil.

With the discharge of 110,000 bbl. of Kuwait crude oil from the tanker Apache Canyon, the company said this shipment was the last under a contract made early last year for the purchase of crude from Anglo-Iranian Oil Co.

The Apache Canyon loaded in the Persian Gulf June 30 and was cleared through United States Customs in New York August 3.

"Affiliates of the Jersey company have not loaded any other cargo of crude oil in the Middle East for importation into the United States since this cargo," the company announcement said. "There are no present plans by affiliates of Standard Oil Co. (N. J.) for any further importation of Middle East crude," it added.

The Jersey statement said the contract with Anglo-Iranian was made "in order to assure adequate supplies of oil products regardless of the severity of last winter's weather."

Receipts of Middle East crude by Jersey affiliates, it said, reached a peak of 88,377 bbl. daily in February this year.

The Jersey company in April revised its purchase contract with Anglo-Iranian discontinuing deliveries until January 1952 *(The Oil and Gas Journal, July 21, page 48)*.

House Passes Bill to Aid Small Refiners

WASHINGTON. — Without debate, the House last week approved legislation designed to relieve small refiners who contracted to buy government royalty oil at a premium in 1947, but in somewhat different form from the bill passed by the Senate July 6.

The difference between the two Houses, however, are not such that any difficulty is anticipated in getting final enactment of the legislation, since they create no new issues but are confined to administrative provisions.

this week

FOREIGN OIL—Middle East crude is now able to undersell Texas and Caribbean crude in Europe, Argentina, and other markets. . . . Virtually competitive with domestic crude on U. S. Atlantic seaboard. . . . Due chiefly to current low tanker rates. . . . Price f.o.b. Persian Gulf recently lowered, but believed still well above production costs. . . . ¶Standard Oil Co. (N. J.) announces it has stopped importing Persian Gulf oil to the United States. . . .

WASHINGTON—Tidelands compromise fails. . . . State and federal officials disagree on management, boundaries, effective date. . . . Congressional deadlock due to continue. . . . ¶House passes bill to exempt independent natural-gas producers from FPC regulation. . . . But administration opposition indicates it will not become law soon. . . . ¶Major fight brews in attempt to revise regulations for oil leasing of federal Government's acquired lands. . . .

DEEP FINDINGS—The world's deepest well found no oil but produced valuable geological data. . . . Superior Oil Co. releases log of formations penetrated. . . . Confirms belief that sedimentary basin of southwestern Wyoming may be more than 30,000 ft. thick. . . . At 20,000 ft. the well only touched the Upper Cretaceous. . . .

TRENDS—Crude-oil production of 4,678,520 bbl. per day week ended August 6 was 5,120 bbl. per day over previous week. . . . ¶Total of 752 wells completed compares with 789 previous week. . . . Cumulative total this year of 22,129 compares with 21,667 completed this time last year. . . . ¶Wildcat completions week ended August 6 were 153 compared with 154 the previous week and with 145 corresponding week of 1948. . . . ¶East Coast prices for heavy fuel oil go up a dime as demand stiffens. . . . Industrial users still shifting from coal to oil. . . .

INTERNATIONAL—Glimpse behind the iron curtain reveals a serious oil situation in Communist-dominated Europe. . . . Czechoslovakia is desperately short. . . . Gets no fuel or lubes from Russia, can't import from the West. . . . Meager indigenous sources pushed to limit. . . . ¶Long delay expected before Alberta natural gas is exported to U. S. . . . Rival firms bid for right to build pipe lines, while provincial government ponders export policy. . . . ¶Work ready to start on western end of Trans-Arabian pipe line as long-delayed materials start arriving. . . . ¶Truman hints Mexican oil-loan talks may be revived. . . .

PIPE LINES—New Mid-Valley Pipeline Co. awards contracts for 857 miles of 1,000-mile Longview, Tex.-Lima, Ohio, crude-oil line. . . . ¶Humble Oil & Refining Co. announces work will get under way by the end of this year on a new $18,000,000, 375-mile, 18-in. pipe line from West Texas to the Gulf Coast. . . . ¶Northern Natural Gas Co. rejects proposed gas-purchase contract with Trunkline Gas Supply Co. . . . ¶Texas Illinois Natural Gas Co. applies to FPC for permit to construct and operate 1,018-mile natural-gas line from Gulf Coast area of Texas to Joliet, Ill.

NATURAL GASOLINE—Maysville light hydrocarbons manufacturing and repressuring project now in full operation in Oklahoma's "Golden Trend" area. . . . Capacity is 81,000,000 cu. ft. daily. . . . ¶Operations under way at new Burnell-North Pettus gasoline plant. . . .

The St. Paul Socony, with 2½ million gal. of gasoline in her barges, entering the locks at Keokuk, Iowa, en route to St. Paul, Minn. Socony-Vacuum Oil Co., Inc., one of the largest transporters of petroleum on the Mississippi River, has just completed increasing the power of its three towboats by 25 per cent to speed the up-river trip. The St. Paul Socony now has 2,000 hp.

Deepest Well Confirms Theories Of Regional Conditions

by Charles J. Deegan

GEOLOGISTS have been busy studying the data released by Superior Oil Co. on the world's deepest hole, 1 Pacific Creek Unit, in 27-27n-103w, Sublette County, southwestern Wyoming, total depth 20,521 ft. Here are some of the conclusions they have reached so far, about what is important.

This well confirms previous conclusions that there is an extremely deep sedimentary trough or syncline in front of the Wind River Mountains, i.e., south and west of the main range. At total depth of 20,521 ft. the Superior well had tested only the Frontier, which is well up in the Upper Cretaceous.

This came as no particular surprise to geophysicists and geologists who have checked geophysical work in that part of the country. Nor will it surprise those geologists who have had access to the considerable amount of work done by graduate students of University of Wyoming. Some of this work has had limited publication and circulation, some of it has not been published, although available at the university.

On basis of this evidence, it is believed that the Wind River Mountains represent a major overthrust to the south and west. Shooting evidence has been such that it called for a sedimentary section at least 30,000 ft. thick, perhaps as much as 40,000 ft. in places.

The generalized formation log, released by Superior and shown on the opposite page, contains some surprises and some things that are unusual only to the extent that they are surprisingly normal. The upper portion of the log shows about 7,600 ft. of Wasatch, unquestionably Tertiary. If later independent checks of samples find other geologists in agreement with this, it means a Wasatch thickness at least 50 per cent greater than anyone would have expected on the basis of previous knowledge of Wasatch sections. The base of the Wasatch is a well-known geological marker, and at this point geologists are still in familiar territory.

From 7,600 to 10,740 ft. the log identifies the section as Fort Union-Lance undifferentiated. This is geological territory in which it is easy to find differences of opinion—some of which may or may not be partly reconciled after the paleontologists get through checking samples from this well. Is it the base of the Tertiary—or is it the top part of the Upper Cretaceous? You can find paleontological evidence to support either point of view.

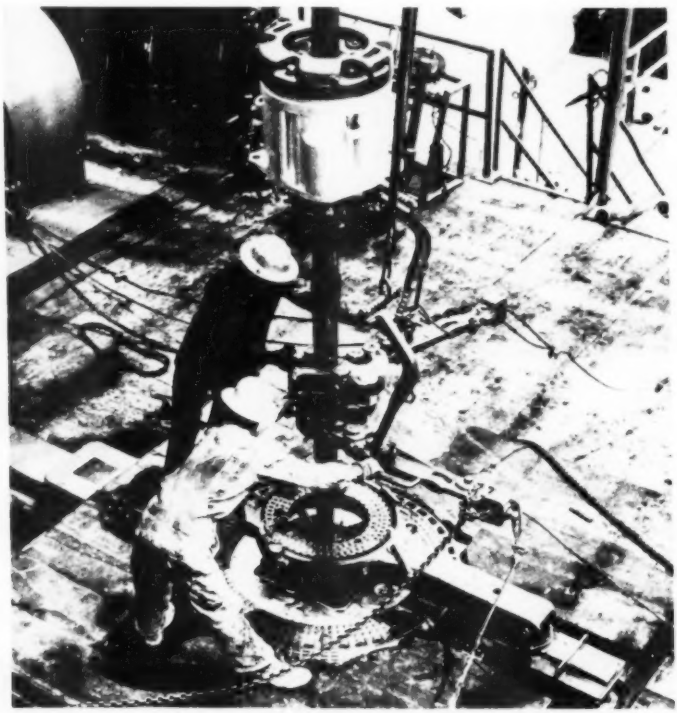
Some pretty good geologists take the position that this is another of those not-too-rare cases where local areal conditions do not fall into the conventional world-wide groupings. Instead of Eocene or Lower Eocene, they prefer to consider the Rocky Mountain Fort Union-Lance a special case of transitional zone and label it Paleocene.

Next call on the log is at 10,740 ft., top of the Lewis shale, which is definitely Upper Cretaceous, and about the normal upper limit of Cretaceous to be expected in the Rocky Mountains. From the top of the Lewis, through the Mesaverde, Blair, Baxter shale, and Frontier, the section is thoroughly normal both in sequence and in thicknesses. Some geologists might consider such complete normalcy as a bit surprising in this particular case; some might not.

Very little lime or dolomite would be expected in the section drilled, and the driller's log shows this to be true. Between 3,520 and 3,580 ft. some streaks of lime are reported in a predominantly sand and shale section. An 81-ft. interval at 3,764-3,845 ft. is reported as sand and lime. That is all the calcareous material reported in the Tertiary section. At 12,434-12,442 ft. an 8-ft. section in the Mesaverde is reported as sand with streaks of dolomite. Below that no more limes or dolomites are reported.

Occasional streaks of coal are reported in the Tertiary between 5,325 ft. and 6,275 ft., along with occasional streaks of bentonite, in a predominantly sand and shale section. Lignite streaks are recorded several times in the Lewis shale and upper part of the Mesaverde, both Upper Cretaceous. The first record on driller's log is in a 19-ft. interval at 11,358-11,377 ft.; the second in a 63-ft. interval at 11,442-11,505 ft.; both in the Lewis shale. The last lignite streaks reported are in the Mesaverde, in a 12-ft. interval at 11,749-11,761 ft.

Of a total of 32 cores taken, only 8 had as much as a smell. Seven of these were in the Mesaverde, one in the Blair. The accompanying box contains data released on these 8 cores.



Floor men "breaking out" the kelly while working on the world's deepest drilling venture. Nearly all rig equipment is of record size

Cores Taken Which Showed Signs of Gas or Oil

12,726-12,734 ft., recovered 6½ ft. gray salt and pepper sand, fine to medium, clay cemented, slight distillate odor at bottom.

13,248-13,268 ft., recovered 17 ft. sand, brownish gray, fine, slight oil saturation. Poor to fair distillate odor, thin carbonaceous partings.

13,619-13,624 ft., recovered 32 in. brownish gray sand, fine to medium, tight, faint to fair odor; 16 in. hard brown shale.

13,684-13,694 ft., recovered 7 ft. 3 in. fine brownish gray, hard, tight sand, good stain, fair odor, no cut; 2 ft. 9 in. grayish brown shale.

13,854-13,874 ft., recovered 19½ ft. sand, fine to medium, brownish gray, slight stain, faint odor, no cuts.

14,554-14,568 ft., recovered 4½ ft. sand, white to brown, fine to medium, slight odor and stain; 8 ft. brownish black shale.

14,755-14,767 ft., recovered 5 ft. 7 in. sand, gray, fine to tight, faint odor, stain, no cut; 3 ft. 2 in. brownish black shale.

15,764-15,784 ft., recovered 14½ ft. sand, white, salt and pepper, faint odor, no stain or cut, tight, medium grained.

Five cores taken in the Frontier found either shale, shaly sands to sandy shales, or hard, white sand.

Formation Tests Taken Which Showed Signs of Gas or Oil

Out of 17 formation tests reported, 12 had some slight indications of gas. They were as follows:

11,002-11,022 ft. (10-16-48), 2,000 ft. water cushion in 4½-in. drill pipe, 45 minutes, recovered 126 ft. slightly gas cut mud.

11,639-11,749 ft. (11-5-48), 2,000 ft. water cushion in 4½-in. drill pipe, packer failed after 15 minutes, recovered 350 ft. gas-cut mud, good odor.

11,997-12,108 ft. (11-17-48), 4,000 ft. water cushion in 4½-in. drill pipe, 30 minutes, recovered 437 ft. gas-cut mud, gasoline odor.

12,200-12,451 ft. (12-1-48), 3,530 ft. water cushion in 4½-in. drill pipe, packer failed after 6 minutes, recovery 275 ft. gas cut mud.

13,219-13,287 ft. (12-24-48), 500 ft. water cushion in 4½-in. drill pipe, packer failed after 16 minutes, recovered 3,800 ft. gas cut mud.

13,830-13,870 ft. (7-1-49 first test) through 7-in. casing, perforated four shots per foot, water cushion 2,040 ft. in 3½-in. drill pipe, open 6⅓ hours, recovered 610 ft. net rise, gas cut mud. (7-4-49 second test), 2,040 ft. water cushion, in 3½-in. drill pipe, open 5½ hours, gas to surface in 40 minutes, weak blow, recovered 1,320 ft. net rise, gas cut mud.

14,505-14,540 ft. (7-8-49) through casing perforations, four shots per foot; water cushion 2,040 ft., in 3½-in. drill pipe, open 2 hours 52 minutes, gas to surface in 61 minutes, weak blow, recovered 8,820 ft. net rise of mud. (Safety joint leaked, accounting for rise.)

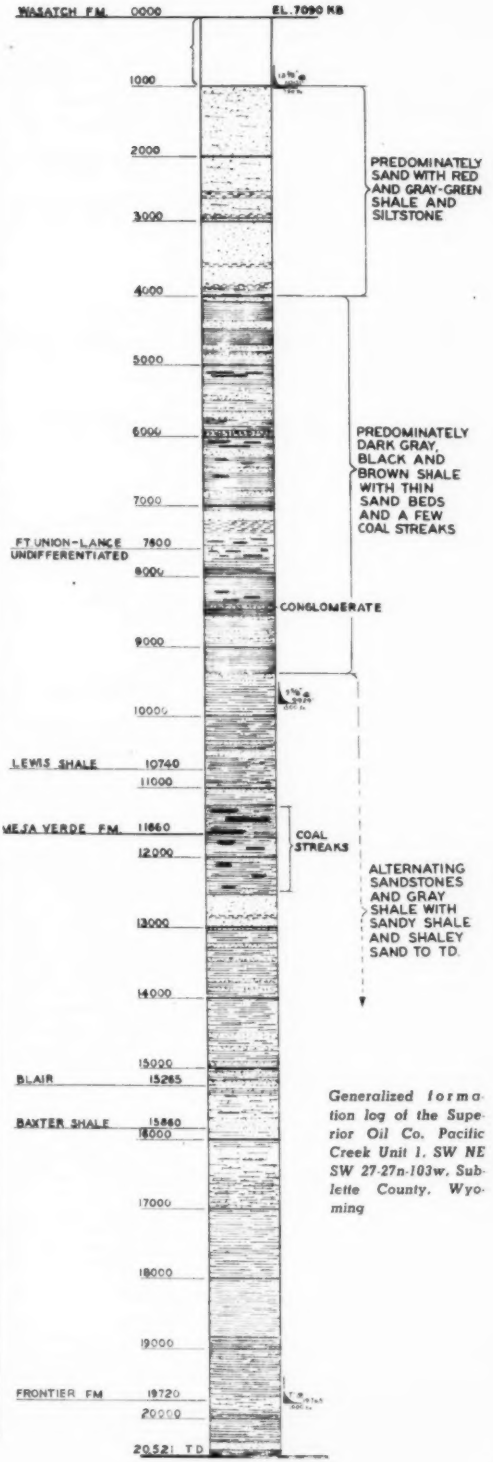
15,660-15,720 ft. (7-11-49) through casing perforations, 4 shots per foot; water cushion 3,000 ft., in 3½-in. drill pipe, open 13 hours, gas to surface in 67 minutes fair volume. Recovery 2,610 ft. net rise, gas-cut mud.

17,435-17,485 ft. (7-14-49) through casing perforations, four shots per foot; water cushion 3,000 ft. in 3½-in. drill pipe, open 5 hours, 27 minutes, weak blow, recovered 2,910 ft. net rise, gas cut mud.

19,705-20,521 ft. (6-19-49) ran formation tester on 3½-in. drill pipe filled with 10,080 ft. water cushion, packer at 19,705 with tail to 19,718 ft., valve open at intervals for 10½ hours. Weak blows, recovered 7,410 ft. net rise, gas-cut mud.

19,765-20,521 ft. (6-28-49) ran tester on 3½-in. drill pipe filled with 8,000 ft. water cushion and 776 ft. Securaloy tail, perforated 20,441-20,481 ft. Valve open 8¾ hours. Weak blow. Recovered 6,425 ft. net rise water, muddy water, and gas-cut mud. Left 454 ft. tail pipe in hole.

13,830-13,870 ft., 14,505-14,540 ft., 15,660-15,720 ft., 17,435-17,485 ft. (7-17-49), tested four previously perforated intervals in casing. Packer set at 13,790 ft. on dry 3½-in. drill pipe, and 2½-in. tail to 15,694 ft. Valve open 5 hours, 50 minutes. Gas to surface in 44 minutes, recovery 9,329 ft. rise, gas and gas-cut mud, no oil.



Generalized formation log of the Superior Oil Co. Pacific Creek Unit 1, SW NE SW 27-27n-103w, Sublette County, Wyoming

International

WORLD-WIDE OIL DEVELOPMENTS

First Materiel Shipment for West End of Tapline en Route

THE first shipload of materials and equipment for the commencement of construction on the western end of the 1,067-mile Trans-Arabian pipe line is scheduled to arrive in Beruit, Syria, in mid-August.

The Anniston City of Isthmian Steamship Lines is en route from Houston with 4,000 tons of cargo for the line. Much of the cargo is heavy transportation and handling equipment, including some mobile cranes deckloaded without dismantling, to allow quick use.

First step will be the construction of a camp near the Mediterranean terminal site at Sidon. Williams Brothers Overseas Co., which has contracted to provide personnel and supervision for laying this end of the line, has headquarters at Beruit.

Trans-Arabian Pipe Line Co. has let a contract to Graver Tank & Manufacturing Co., East Chicago, Ind., for pier and other facilities at the terminal. The pier will be built out to 15-ft. water depth to accommodate smaller craft.

Pipe is expected to begin arriving in September, and the company plans to lay eastward as rapidly as possible. Two ships a month are scheduled after the work gets under way.

The signing of a transit agreement with the Syrian Government cleared the way for full-scale work on the Tapline. Bechtel International Corp. has been working westward in Saudi Arabia, and about 260 miles of the 30-31-in. line has been laid. Some station construction work was commenced in May.

Export of steel pipe sufficient for 672 miles of the line has been approved by the Department of Commerce, and further licenses are scheduled without delay. About 115,000 tons, equivalent to about 482 miles, of the 260,000-ton total required has been shipped.

Plans for the Mediterrancan terminal call for 16 tanks of 180,000-bbl. capacity each. Gravity flow will be employed to the possibly six offshore loading stations.

Reports from Lebanon said the company is negotiating for about 1 sq. mile of land for use as the terminal. The company is negotiating directly with the landowners but the Lebanon Government was ready to assist if a private agreement cannot be reached.

Truman Says Mexican Loan Not Dead Issue

WASHINGTON. — The Mexican oil loan is not a dead issue, President Truman insisted last week.

The President told a news conference the Government is still working on the loan and he hopes it can be arranged.

Inferentially he denied reports that the recent suspension of negotiations was due to a demand that the Mexican Government satisfy the claims of certain United States citizens, saying the United States has never refused to make a loan for the Mexican oil industry.

In explaining the suspension of negoiations last month, the State Department said it did not believe the loan which Mexico requested for refining and transportation facilities was justified by the crude production in sight. From Mexico this week came reports that the Government is considering an internal loan to raise money for development work designed to increase output. It was also reported that steps were under consideration to increase efficiency in Pemex operations, although it had not been disclosed in Washington that this had been discussed.

It is understood, however, that the State Department did make some suggestions to the Mexican authorities regarding matters other than oil during the discussions with Sen. Antonio J. Bermudez, director general of Pemex, and other officials.

The oil loan was only one of several which Mexico has been seeking of the United States, and the discussions have covered the whole field of the Mexican economy.

Cal Tex Price Rebate Saves ECA $1,000,000

WASHINGTON.—A voluntary reduction in the price of oil sold under ECA authorization last year to Regent Oil Co., Ltd., London, by California Texas Oil Co. will save nearly $1,000,000 in European Recovery funds, it was announced last week by the Economic Cooperation Administration.

The ECA explained that the oil company has reduced its bill of $4,086,313.76 for eight cargoes of gasoline, kerosine, and diesel oil imported by the British company from Texas and Bahrein Island between July and October, 1948, to the low price quotations current at time of shipment.

As a result, it refunded $979,101.55 to the British buyer, and the British Government subsequently reimbursed the ECA in that amount.

The company's action was made to comply with the supplier's certificate required in all ECA-financed transactions that the prices charged were in line with market quotations.

Iranian Parliament Fails To Ratify Royalty Pact

A filibuster by minority opposition last week reportedly had killed for the present the agreement reached between Anglo-Iranian Oil Co. and th Government of Iran.

Under the agreement Anglo Iranian would have increased by nearly 50 per cent its royalty payments to the government *(The Oil and Gas Journal, July 28, page 179)*. Ratification by parliament was needed to put the agreement into effect.

It is expected that company-government negotiations will be reopened, with a new agreement expected to be submitted at the next meeting of parliament, which will be in about 2 months.

The opposing faction argued that Iran should receive 50 per cent of Anglo-Iranian's profits.

Rival Firms Bid for Permits to Export Alberta Natural Gas

TWO rival companies are attempting to obtain the governmental authorizations required for the construction of a natural-gas pipe line from Alberta to the Pacific Coast.

The market in southern British Columbia, Washington, and Oregon is considered sufficient to support only one major gas-transmission project, and what line finally wins the necessary permits is expected to depend on the showing made before Alberta and other officials in gas reserves and other considerations.

The companies which have proposed gas lines to the Pacific Coast are Northwest Natural Gas Co. and Westcoast Transmission Co. Northwest Natural is headed by A. Faison Dixon, New York, as president, and Westcoast Transmission by Frank McMahon, Calgary.

Both projects, as well as the eastward Canadian line to Winnepeg planned by Western Pipe Lines, Ltd., apparently received a setback late in July when E. C. Manning, Alberta premier, said no application for export of gas from the province will be considered for the time being.

There were published reports in New York last week that the Westcoast Transmission project had been indefinitely postponed. However, an official of a financial house connected with the venture said it had been realized from the beginning that considerable time would be required for such a project and that, as far as he knew, there had been no change in the situation.

Several Permits Needed

A series of authorizations from Alberta provincial, Canadian dominion, and United States Government officials are necessary before an international gas line can be built. In its recent 4-day session, the Alberta legislature revised laws regulating its rapidly expanding oil and gas industry and gave the Petroleum and Natural Gas Conservation Board wide powers over the operations of gas transmission companies. Permits are required for gas export, and these may be held up until a survey shows the extent of reserves in the province.

Five pipe-line companies were incorporated in acts of the Canadian Parliament earlier this year. They included Westcoast Transmission, Western Pipe Lines and three reported oil lines, Interprovincial Pipe Line Co. (Imperial), British-American Pipe Line Co., and Trans-Northern Pipe Line Co. A charter for Northwest Natural is awaiting action at the Parliament's next session.

Besides incorporation, new dominion legislation provides that the pipeline companies obtain a license from the Utilities Commission authorizing crossing provincial boundaries. In the case of the gas lines which would cross the international boundary, approval of the dominion cabinet for the export must be obtained. With the United States, a Federal Power Commission certificate is necessary as well as a presidential permit for the crossing of the international boundary.

Delay Expected

All these legal and governmental preliminaries point up the likelihood it will be some time before any of the projects materialize.

Dixon, president of Northwest Natural, is with Brokaw, Dixon & McKee, New York engineering company. The Canadian subsidiary of Northwest Natural, and the one to be incorporated in the dominion, is Alberta Natural Gas Co.

Northwest Natural is continuing its plans for the line which has been unofficially estimated to cost $100,000,000. The company has obtained what it considers minimum gas commitments from three major oil-company producers in Alberta and is negotiating for additional requirements from a fourth.

Route studies have been under way the last three summers with the assistance of Alfred Swenerton, San Francisco engineer. Two routes are under consideration, and the project calls for 350 miles or more in Canada and 600 miles or less in the United States. One of the two routes travels a greater portion of its length in Canada. Pipe size planned is 24-in.

The Northwest Natural line is planned to deliver 222,000,000 cu. ft. daily at ultimate capacity with reserves committed sufficient for a 20-year supply. It would serve Vancouver, Seattle, Portland, and Spokane, as well as smaller cities along the route. Morgan Stanley & Co. is chief banker for the project, with Langley & Co., Dominick & Dominick, New York, Moreland & Lynch, Pittsburgh, and others also in the financing.

McMahon, president of Westcoast Transmission, also is head of Pacific Petroleums, Ltd., and Sunray Oil Corp., Tulsa, a substantial stockholder in Pacific Petroleum, is associated in the gas line. Pacific Petroleums and Sunray have major interests in Bear Oil Co., Ltd., with large gas reserves in Alberta.

The Westcoast project is estimated to cost $175,000,000. An announcement of the company in May said plans call for a 30-in. line 1,400 miles in length. McMahon's statement at the time said surveys indicate a market demand of 500,000,000 cu. ft. daily in the Pacific Northwest and northern California and that increases in demand might require the construction of a duplicate line in the more distant future.

The eastward pipe line planned by Western Pipe Lines would consist of about 710 miles of 22 and 24-in. with the cost estimated at about $48,000,000. The line would serve parts of Saskatchewan and Manitoba. Western Pipe Lines is half owned by International Utilities, a holding company with interests in Canadian distributing systems.

Alberta Board Preparing To Set New Allowables

A natural water drive is replacing about 90 per cent of the oil withdrawals of the reservoir of Redwater field, the Alberta Petroleum and Natural Gas Conservation Board was told at hearings preliminary to setting new allowables for Alberta fields.

The board is preparing to exercise the authority just given it by the Alberta Legislature to set allowables on the basis of market demand. Heretofore the board has set allowable on the basis of conservation only.

J. D. Gustafson, division engineer for Imperial Oil, Ltd., told the board that Redwater could sustain production at the present allowable of 450 bbl. per well per day for at least 15 years, because reservoir pressure has dropped only 30 psi. from the original 1,050 psi. instead of an anticipated drop of 250 to 300 psi. At present, however, Redwater wells are producing only about one-quarter of the allowable.

Shell Issues New Product Output Figures for Cardon

The Shell organization has corrected the figures originally given in the company publication for the production of the new refinery at Punta Cardon in northwestern Venezuela (The Oil and Gas Journal, July 7, page 42).

The daily intake of the plant will eventually be increased to about 90,000 bbl., and when all units are working at capacity, annual output of products will be approximately:

	Bbl.
Aviation gasoline	566,000
Motor gasoline	6,290,000
Kerosine	566,000
Diesel oil and gas oil	5,032,000
Lubricating oils, all grades	881,000
Fuel oils	17,297,000

Czechoslovakia's Petroleum Outlook

New 5-Year Plan, Designed to Make Nation Self-Sufficient, Now Under Way

International
WORLD-WIDE OIL DEVELOPMENTS

BECAUSE of the blackout of information from countries behind the Communist Iron Curtain, data on the oil industry of Eastern Europe are of more than ordinary significance. This article summarizes the history, present status, and future prospects of oil production in Czechoslovakia. It was prepared by an oil-field engineer who has left the country. By American standards Czechoslovakian oil production is infinitesimal; but to the country itself, every gallon of indigenous output is important.

SINCE ancient times surface outcrops of oil and gas have been known in the area now covered by Czechoslovakia. Most of them are found in the heavy faulted Flysch area of the Tertiary in East Slovakia near the Polish boundary as well as in the center of the country where Moravia and Slovakia meet. These small natural oil springs were and are still economically unimportant. They were used by the local population for domestic purposes. Naturally the beginning of oil production on the other side of the Carpathian Mountains in Polish Galicia encouraged work in Slovakia.

The first reports of attempts to develop oil deposits in the area of what is now Czechoslovakia on an industrial basis came in the 1860's. At that time two shafts with a depth of 30 and 50 ft. and with adjoining horizontal galleries were sunk near Mikova in East Slovakia. Later shafts were sunk at other places but gave—if at all—only low yields. In no case did the production cover expenses, and because at that time the work was done without scientific advice and sufficient capital, all these efforts remained unsuccessful.

When oil production in Polish Galicia boomed in the 1880's, more serious drilling in the Flysch area of Slovakia commenced. From then on a considerable number of deep wells (up to 3,000 ft.) were drilled in East Slovakia (Flysch beds of the older Carpathian Tertiary) near Mikova, Vysni Komarnik, Radvane, Kriva Olka, and in the Moravian Slovakian border area near Turzovky, Staskova, Bohuslavice nad Vlarou, Napajedla, and other localities. Wildcatting also was undertaken at Gbely, Hodonin, and Ratiskovice, where the Flysch is overlayed by the younger Neogene.

In many of these holes oil or gas shows, and some production were obtained. The best results came in two Flysch wells near Turzovky in 1929. Each of these yielded more than 150 tons of crude of good quality and high gasoline content. However, expenses still were higher than returns from the production.

In 1914, first commercial production was obtained when a well at Gbley in West Slovakia at a depth of 535 ft. encountered the Sarmat beds of the Lower Tertiary. The initial production of the first well was 15 tons daily (about 100 bbl.) of a crude highly suitable for the refining of motor, transformer, and lubricating oils. Another deposit of industrial importance was found in 1923 near Hodonin which produced from the same geological beds. Since then the oil production of both fields has been developed up to a level of about 15,000-20,000 tons annually (105,000 to 140,000 bbl.).

War Hurt Output

When the Germans came to the fields, attempts were made to raise production. In 1941 a production of about 36,000 tons (about 250,000 bbl.) was reached and maintained during the two succeeding years. In 1944 and 1945, when the fighting approached and overran the area, equipment was damaged and output declined sharply.

The new Czechoslovakian Government, realizing the importance of oil production to the indigenous economy, quickly began to promote the recovery of the fields. Remaining German equipment was confiscated, and since sufficient trained personnel of Czechoslovakian nationality was available, the area was soon rehabilitated.

With regard to organization, the oil production as well as the refineries were joined in a state company, "Moravske naftove zavody narodni podnik," Hodonin. This organization is supervised by the Ustredni reditelstvi Ceskoslovenskych dolu in Prague

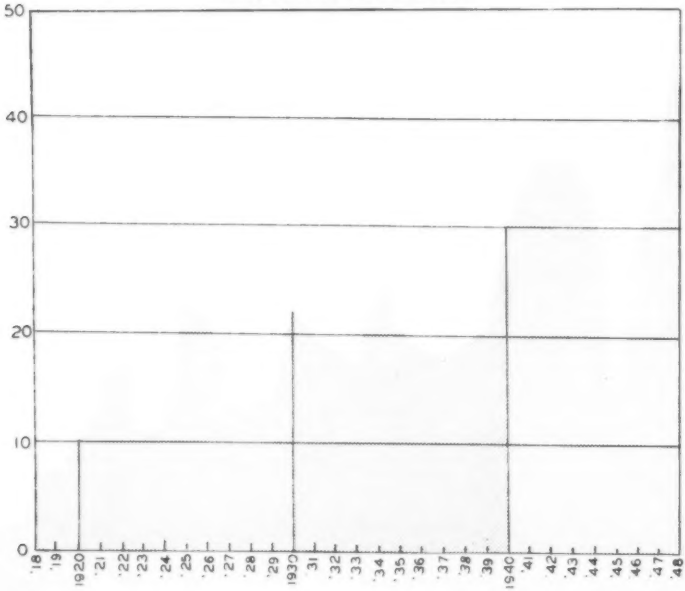
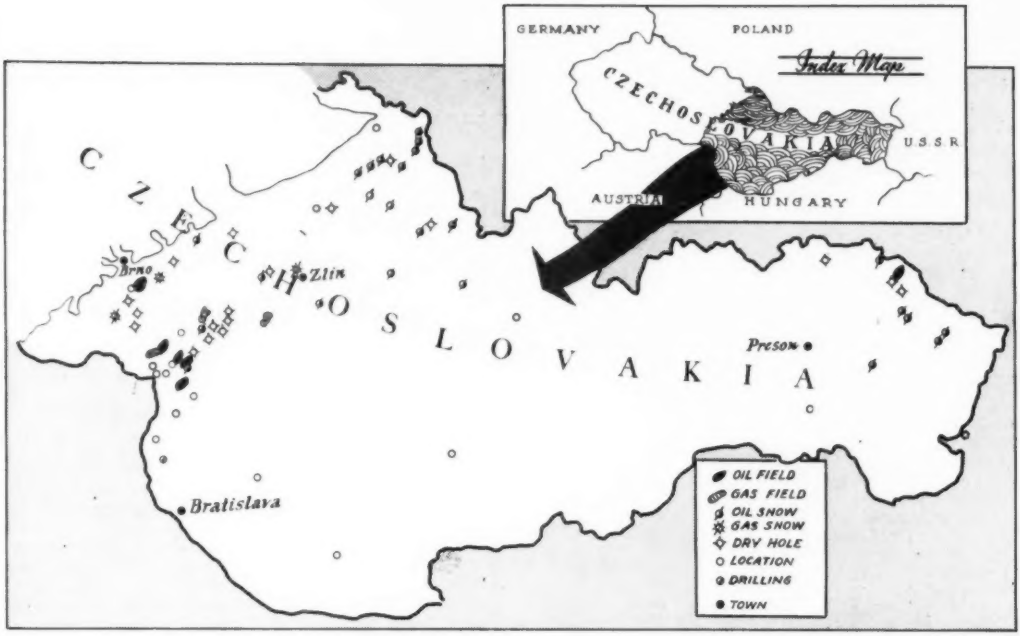


Chart showing how production has increased in Czechoslovakia since 1918. Deep dip at right shows effect of war on the productive ability of the country's fields



Oil map of Czechoslovakia showing location of fields, dry holes, and wells currently drilling

(Central Direction of the Czechoslovakian Mining Industry).

The organization avoided an excess of bureaucracy, and the financial basis of the operations was sounder after the nationalization. Supplying the fields with derricks, pipe, and other equipment was facilitated by the central direction and the state authority. Nevertheless, expenditures continued high, and responsible positions were occupied not according to the ability of the applicant but by political points of view. Furthermore, work discipline deteriorated to the point that the government was forced to make repeated stern warnings. Lack of responsible officials and growing corruption exerted an unfavorable influence on the efficiency of operations.

At the same time a close cooperation with various scientific institutions was reached. The iron and steel works were ordered to erect special plants for oil-field equipment which was produced according to American designs or the plans of the users. At present Czechoslovakian industry is even exporting drilling and production equipment to the Soviet Union. The production goals for the years 1947 and 1948, for which a 2-year plan had been created, were 54,000 and 82,000 tons of crude, respectively, (about 380,000 and 575,000 bbl.).

These goals were by far not reached. Official figures were not announced but it is known that in 1947 about 35,000 tons (about 245,000 bbl. or 670 bbl. daily), and in 1948, nearly 49,000 tons (about 342,000 bbl. or 940 bbl. daily) was produced.

A new 5-year plan beginning with this year is aimed at giving self-sufficiency in fuel. This is to be attained by higher oil production and by enlargement of synthetic-fuel recovery. There is reason to doubt that this goal will be reached in view of the country's steadily increasing demand. In the past, indigenous production always has met only a small part of the demand. There is now in Czechoslovakia an even greater scarcity of fuel than during the war years. The black market sells gasoline at fantastic prices. This shortage is in some part due to the mechanism of agriculture which was advanced in a quick tempo to replace the human labor of the expelled Germans and Hungarians.

Expansion Planned

An extraordinary role in the Czechoslovakian fuel supply is played by the Stalin Works at Most (Brux), a large hydrogenation plant build up by the Germans during the war. The damage at Brux caused by Allied air raids has been repaired, and the 5-year plan foresees a doubling of throughput capacity. This has been planned, although the manufacturing of oil from coal at Brux has proved to be very expensive and the state is forced to pay subsidies. Czechoslovakia is dependent on this oil because she has no foreign exchange to finance imports from the western oil countries and she gets no fuel and lubricants from Soviet Russia. In southeastern Moravia and west Slovakia the motor traffic is almost completely dependent on natural gas which comes from a number of producing wells feeding a newly erected network of methane-gas filling stations. Pioneer work along this line was done by the widely known Bata concern at Zlin. Considerable amounts of gas are also delivered to the Czechoslovakian state railways and the gas works in several towns of South Moravia.

About 1,200 wells have been drilled in Czechoslovakia with an average depth of between 500 and 1,200 ft., 85 per cent of them in the Hodonin-Gbely area. Some wildcats reached a depth of 3,000 ft. and more. For future exploration the South Moravian Neogene area is regarded as prospective. Some structures have been recognized which may give production. Middle Moravia near Sokolnice and Prerov, the Neogene of East Slovakia, and the Flysch of the Slovakian Carpathian Mountains are potential wildcatting districts.

Although it seems impossible to reach fuel self-sufficiency as the 5- year plan requires, there are good chances for an increase in Czechoslovakian oil production on a limited scale. It remains to be seen in the coming years whether the nationalized industry is capable of overcoming the technical difficulties and filling up the gap which arose when free private enterprise was eliminated.

International
WORLD-WIDE OIL DEVELOPMENTS

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Too-Big "Independents"

WASHINGTON.—It took several weeks for the House interstate commerce committee to get to the House with the bill exempting independent producers and gatherers of natural gas from Federal Power Commission control, but it finally got there despite the vigorous opposition of Committee Chairman Robert Crosser of Ohio.

Crosser made no secret of his displeasure with the bill written by his committee, filing a lengthy statement in the Congressional Record denying that it was ever the intent of Congress to leave a gap between state and federal regulation and charging that the exemption would result in higher costs to gas consumers amounting to many millions of dollars yearly.

At the same time, Crosser indicated he was not opposed to granting exemption to the really small independent producers and gatherers, representing all but 35 of the approximately 2,300 producers making sales to interstate pipe lines.

To provide relief for the small producers without conferring great benefits upon the large ones, Crosser would have the exemption limited to persons whose total sales of natural gas in interstate commerce, individually or in the aggregate with affiliated producers and gatherers, do not exceed on an annual basis 2 billion cubic feet computed at 14.65 psia. at 60° F., and who are neither natural-gas companies by reason of other activities nor affiliated with natural-gas companies.

Arms and the Oil

OIL requirements of the western European countries may be considerably increased if the $1,450,000,000 military assistance program now under consideration in Congress goes through.

Under that program, the United States will provide not only arms and equipment but also technical and training assistance, both calling for considerable volumes of oil products since equipment is unusable and training is ineffective without motor fuel.

An interdepartmental coordinating committee has drawn up an outline of what Europe will require to make its military forces effective against Russian aggression. The European countries themselves are spending approximately $5,500,000,000 on defense, and the administration proposes to provide another billion in arms, equipment and assistance, although there is some doubt whether Congress will be willing to throw that much into the pot at this time in view of our own budgetary difficulties.

It is proposed to furnish the Atlantic Pact nations with the usual items of ammunition and artillery, and also with special-purpose vehicles, tanks, and vessels—the equipment which will call for petroleum products.

If the plan goes through it is expected the European countries will have to build up their military supplies of oil products against a possible interruption of imports in an emergency, and also to acquire products for use in training their armies on the new equipment.

Just how much business this would mean for American oil companies—and consummation of the plan, of course, lies many months in the future—will depend largely on dollar exchange available to the participating countries.

Dollars for Oil

THE 10 per cent reduction in the Economic Cooperation Administration appropriation proposed by the Senate may require a cut of $45,000,000 or more in ECA financing of purchases of dollar oil.

ECA's basic figures on western European requirements during the current fiscal year included $507,200,000 for dollar oil, toward which ECA would contribute $451,300,000. The latter figure is the one that would be affected by any cut in appropriations, correspondingly increasing the amount of dollars which the participating countries would have to use out of their own exchange reserves unless they proportionately reduced their total purchases.

The ECA tabulation showed that the Marshall-plan countries would buy $480,800,000 worth of oil in the United States during the current year, of which $443,400,000 would be ECA financed, together with $15,500,000 worth from other Western Hemisphere countries and $10,900,000 worth from other nonparticipating countries, a total of $26,400,000 toward which ECA would contribute $7,900,000.

If the ECA fund is cut when the bill finally passes Congress, however, the actual reduction in the volume of oil or any other particular commodity will be worked out on the basis of its importance and the then-prevailing price level.

Oil is one of the most important products in the whole list, and the estimates would have to be very carefully studied to determine the maximum reduction that could be made without endangering Europe's industrial recovery.

The final result would probably be that some funds would be cut more than the average, others less, in an effort to balance the program and minimize the burden upon the participating countries.

Is It Legal?

THE big question affixed to legislation now being considered by Congress, the bill to amend the Natural Gas Act included, is: "Is it legal?"

Under the Congressional Reorganization Act of 1946, Congress is required to end its session not later than July 31 except in time of emergency or unless Congress itself provides otherwise.

Republican members are pressing the point that Congress has not had the legal right to sit since July 30, since no action has been taken to prolong the session either in the form of a congressional resolution or a presidential proclamation of an emergency. House Speaker Sam Rayburn has ruled that the war emergency still exists and no formal action extending the session is necessary.

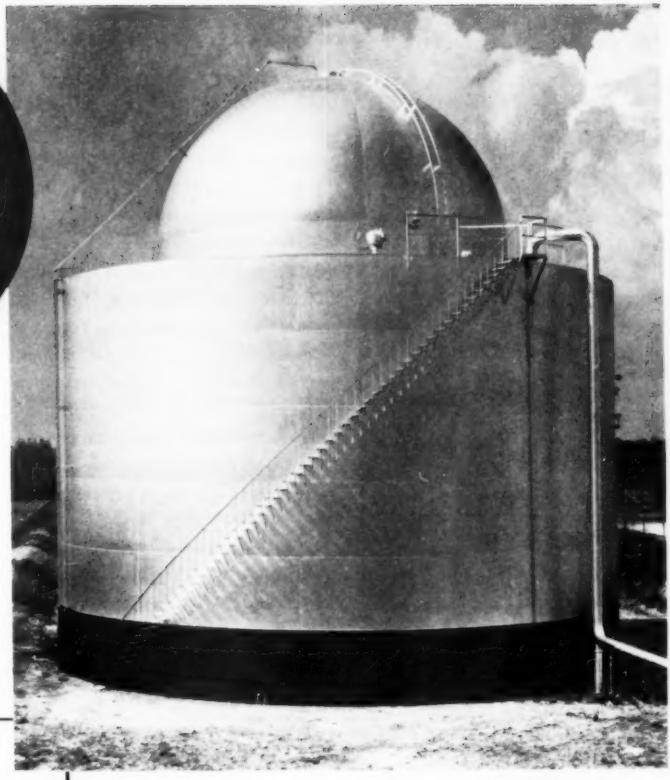
Whether the matter will ever be carried to the courts for decision can't be foretold, of course, but Rep. John W. Heselton of Massachusetts, who is opposed to the legislation, predicted last week that legality of the Natural Gas Act revision bill will be challenged, telling the House he had that information on "reliable authority."

Heselton also warned that proponents of the legislation should be careful to establish that a quorum is present and voting on any amendments that might be written in.

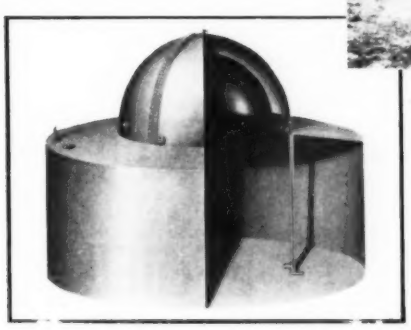
The Republicans, anxious to call it a day and go home, are raising the point of legality on every bill that is brought up for action—just a little friendly needling of the administration leaders—but there is a good chance somebody may decide to test the point in the courts. Very likely, the courts would hold that since the President has never declared the war emergency has ended the extended session is legal. But if, by any chance, a contrary decision was handed down, the confusion would be terrific, with big departmental appropriations, including that for ECA, arms for Europe, and a lot of other laws all dropped into the wastebasket because they were not enacted prior to August 1.

The HORTON VAPORDOME ROOF

holds the "breath" of tanks used for standing storage



RIGHT: 60-ft. diam. by 40-ft. tank equipped with a 38-ft. diam. Vapordome Roof for Continental Oil Company at Galena Park, Texas. The vapor line connecting the Vapordome Roof to the vapor spaces of four 10,000-bbl. tanks is shown at the right.



Patent applied for

This cut-away diagram shows you how a Vapordome Roof operates. A flexible membrane is attached by its outer edge to the equator of the Vapordome. When the air-vapor mixture inside the tank expands, this membrane moves upward to provide the additional capacity required without allowing vapor to escape from the tank. When decreasing temperature causes the vapor to contract, the membrane drops down.

You can prevent evaporation losses from several standing storage tanks by installing a Horton Vapordome Roof on one of them. Vapors displaced from the cone-roof tanks in the group by breathing or unbalanced filling flow into the Vapordome Roof and there they are held. This flow of vapors is reversed when the atmospheric temperature drops or liquid is withdrawn from the tanks.

Here are some other benefits you get with the Vapordome Roof (1) Needs no ground space—easily installed on either new or existing tanks; (2) Can be used to serve a single tank or operate as the central unit of a vapor-saving system serving several tanks; and (3) Tanks can be added to or removed from the vapor-saving system without taking either the Vapordome or interconnected tanks out of service.

For standing storage of products like crude oil and gasoline, the Vapordome Roof will pay for itself by "holding the breath" of your tanks. Get complete engineering data on Vapordome Roofs and vapor-saving systems by writing our nearest office.

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Birmingham, 1 ..... 1536 North 50th St.
Boston, 10 ..... 1025 201 Devonshire St.
Chicago, 4 ..... [illegible]
Cleveland, 15 ..... 2201 Guildhall Bldg.
Detroit, 26 ..... 1514 Lafayette Bldg.
Havana ..... 402 Abreu Bldg.
Houston, 2 ..... 2119 National Standard Bldg.
Los Angeles, 14 ..... 1523 General Petroleum Bldg.
New York, 6 ..... 3347 165 Broadway Bldg.
Philadelphia, 3 ..... 1615 1700 Walnut Street Bldg.
Salt Lake City, 1 ..... 1525 First Security Bank Bldg.
San Francisco, 11 ..... 1254 22 Battery Street Bldg.
Seattle, 1 ..... 1325 Henry Bldg.
Tulsa, 3 ..... 1606 Hunt Bldg.

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Why spend precious piping dollars for excess weight and material? By specifying ARMCO Welded Steel Pipe you can avoid this "tax"— get more pipe for your money.

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You can use ARMCO Welded Steel Pipe with complete confidence. It has a high safety factor against internal and external pressures. Rigid inspections at the factory assure freedom from surface defects.

Use ARMCO Steel Pipe for oil and gas lines, gathering systems and wherever else you need dependable piping. Write us for prices and other data. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., 2165 Curtis St., Middletown, Ohio; 501 Mayo Bldg., Tulsa, Oklahoma.

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Tidelands Legislation Is Given Only Slim Chance of Passage

WASHINGTON.—Irreconcilable differences between federal and state officials last week reduced almost to the vanishing point the chances for enacting legislation settling the tidelands issue before Congress adjourns.

Instead of the bill approved by both groups which House Speaker Sam Rayburn of Texas was hopeful of securing, each side is planning to introduce its own bill this week.

The bills are expected to differ on only three points, but they are vital issues—management, boundaries, and effective date.

At the end of last month it appeared that the federal and state officials were in agreement on all points but management, which was to be left for decision by Congress. But new differences appeared, and state officials charged that Atty. Gen. Tom Clark and Interior Secretary J. A. Krug were backing down on the previous understanding. Efforts by Rayburn to compromise the issues proving futile, he suggested that the only thing to do was for each side to write its own bill and leave it to Congress to decide what should be done.

There is virtual agreement on such matters as the split between the federal and state governments of the revenues from the submerged lands, the application of state conservation, police, and taxing powers over underwater oil operations, and other matters, although whether this agreement will hold will be known only when details of the bill now being written by the administration are disclosed.

The administration bill, however, will provide for federal management of all underwater areas except those within the bays and harbors and navigable rivers. The state bill will provide for management by the states for a distance of 3 miles from low water except in the case of Texas, which is standing out for a limit of 10½ miles.

The government bill is expected to make provision for administration of leasing and other activities by the Interior Department, while the state bill will propose administration by the states, acting as agents of the federal Government.

The issue of the effective date of the legislation is one of financial interest to the states. The administration bill is expected to be applicable from June 23, 1947, the date of the Supreme Court decision in the California case, while the state bill will set a date of January 1, 1949.

If the earlier date applies, Texas and Louisiana would have to divide with the federal Government the revenues they have derived from bonuses paid by companies taking leases in the offshore areas over a period of more than 2 years, as well as any royalties which may have accrued from production. Under the January 1, 1949, date, the states would have to share only the income received this year.

Just how far any legislation now introduced can get this year will depend, of course, on how much longer Congress remains in session. Present plans call for adjournment early next month. To get the bill through would require that hearings be immediate and brief in both Houses, that there be no delay in getting the measure up for consideration on the floor, and that debate be limited, a combination which is difficult to get at any time.

Next Week

Field Processing—Definitions and Pictorial Chart.—A tremendous expansion has developed in what now may properly be termed "field processing." Some years ago there was a pretty sharp split between drilling and producing oil wells and refining crude oil. Today there is a middle phase of some dozen important unit operations in between strictly the drilling-producing and the refining divisions. Next week's Journal will contain a large special multicolor insert chart, with diagrams, illustrations, and data, which possibly for the first time anywhere will comprehensively define and discuss this rapidly growing division of the industry. This newest division has been rather aptly described in the significant phrase, "The Processing of Oil and Gas Now Begins at the Well Head."

Method for reducing petroleum residues to solid coke is described in an article by M. D. Curran. In the process substantial liquid recovery is obtained and the coke produced is oil free.

One of newest field plants to be placed in operation to process natural gas from Hico-Knowles field, Louisiana, is reported on by R. F. Cox, district engineer, Southwest Gas Producing Co., Inc., Dubach, La. Report covers the plant's performance when operating to extract 80 and 60 per cent of the propane from the feed gas, respectively.

Earth subsidence in Long Beach field is discussed by the Journal's California district editor. A series of drawings illustrating methods to protect new wells drilled in the area accompanies the article.

Repressuring in Lance Creek field, Wyoming. A field processing operation described by R. M. Churchwell, division petroleum engineer, Ohio Oil Co., Casper, has been found to be a profitable venture. Details on reservoir performance are included in the article.

In the third and final article on practices in the oil fields of southern Iran, H. W. Lane takes up production methods employed in the area. A group of interesting drawings showing the equipment employed in field stabilization along with other illustrations are included.

Fast drilling of a 10,024-ft. hole in Benedum field, West Texas, is reported by district editor Roy F. Carlson. Included in the report is information on casing and bits. The hole was drilled in the record time of 38-plus days.

A.P.I. Plans Study of Its Top Management

DIRECTORS of the American Petroleum Institute have set up a five-man committee to study possible changes in the Institute's top management as a result of the prospective retirement of William R. Boyd, Jr., as Institute president in a year or two.

Boyd notified the directors at their recent meeting in Washington of his desire to relinquish active management of the organization with which he has been connected since 1920. He has headed the A.P.I. since 1941 and will be 65 next January.

Institute officials emphasized there is nothing immediate about Boyd's retirement and that he merely wished to alert the board so that a thorough study could be made. One plan put forward is for a nonpaid president from within the industry and a full-time vice president to administer the organization.

The committee members who will study the situation but not recommend a successor are: Eugene Holman, president, Standard Oil Co. (N. J.); George A. Hill, president, Houston Oil Co.; R. G. Follis, vice chairman, Standard Oil Co. of California; L. S. Wescoat, president, Pure Oil Co.; and Robert H. Colley, president, Atlantic Refining Co.

PERSONALS

Lane Is Veteran of Oil Operation in Iran, Iraq

H W. LANE, O.B.E., author of a series of three articles on drilling and production practices in Iran, the second of which appears in this issue, is one of the most widely known petroleum technologists of the Eastern Hemisphere. He joined Anglo-Iranian Oil Co., Ltd., in 1922 following service with the Royal Engineers in World War I.

For nearly 24 years he was closely identified with the growth of oil-producing operations in both Iran and Iraq. His company, in addition to its large oil operation in Southwest Iran, is one of the owners of Iraq Petroleum Co., Ltd., which has an important concession in Iraq.

Lane served his company in several technical appointments including the position of superintendent of various fields, and was appointed general fields manager in Iran in 1944, serving in this capacity until 1946 when he was transferred to the company's main offices in London. He was awarded the Order of the British Empire in 1945 for his work in the oil fields during World War II. He is given credit for much of the new technology involved in present-day field operations in Iran.

L. S. Melzer has been named assistant district geologist for Stanolind Oil & Gas Co.'s West Texas-Southeast New Mexico area, and will assist **E. L. Reed**, Permian basin district geological chief, at Midland, Tex. **Charles R. Barr** has been promoted from geologist in the Midland office to area geologist for the east side of the Permian basin.

Dean Wellman, geologist for Shell Oil Co., Inc., at Oklahoma City for the past 4 years, has been transferred to the Denver office, where company staff and operations are being increased.

H. M. Horton, formerly with Superior Oil Co. of California in Colombia and Venezuela, has resigned and returned to Mount Carmel, Ill., as an independent operator.

Robert V. West, Jr., Midland, Tex., has been named chief of the recently established petroleum - hydrocarbons department of Slick-Urschel Oil Co. He will have charge of the firm's interest in gas-processing plants now being constructed in the Benedum field of Upton County, and in Santa Rosa field of Pecos County, Texas. Prior to joining the company, West was on the technical-service staff of Humble Oil & Refining Co. at the Baytown, Tex., refinery.

C. Edwin Mohler, assistant chief geologist for National Associated Petroleum Co., Tulsa, has been named chief geologist. Mohler has been with the firm 4 years, and formerly was with Carter Oil Co. at Mattoon, Ill.

Russell C. Conkling, Midland, Tex., has been named chief geologist for Plymouth Oil Co. operations west of the Mississippi River. He will work with **W. M. Griffith**, vice president and general manager, in handling and supervising exploratory and development work. **W. D. Lane**, Midland, is general superintendent of the territory.

Robert McConnell has joined the staff of Farmers-Union Central Exchange, Billings, Mont., as chief geologist.

J. W. Joyer has been named superintendent of Shell Oil Co., Inc.'s, gasoline plant at Osage, Okla. He has been with the company 24 years.

Ernest L. Berg, formerly geologist in the Midland, Tex., area for Wilshire Oil Co., has become a consulting geologist. Prior to joining Wilshire he spent several years in Saudi Arabia.

Myron T. Herreid has been named to succeed **W. Reed Morris** as vice president and general manager of the gas and coke division, Koppers Co., Inc. Morris is retiring. Headquarters of the division has been moved from Kearny, N. J., to Pittsburgh.

George H. Fentress, engineer for Phillips Petroleum Co. at Golden, Colo., has been transferred to the main company headquarters at Bartlesville, Okla.

S. C. Sandusky, engineer for Ohio Oil Co., has been transferred from Lance Creek, Wyo., to Casper in the same capacity.

R. A. Bishop has opened offices in Calgary, Alta., Canada, as a consulting geologist. He formerly was chief geologist for Socony-Vacuum Exploration Co.

Laban E. Harmon, Standard Oil Co. (Ind.), has been elected chairman of the advisory committee for the Chicago chapter, American Society of Corporate Secretaries.

Harold F. Patterson has been promoted from seismograph party chief to field seismograph supervisor for Stanolind Oil & Gas Co.'s North Texas-New Mexico division. He will be stationed in Fort Worth.

A. Clarence Andrews, field project engineer for Stanolind Oil & Gas Co., has been named superintendent of the Burnell-North Fettus cycling plant near Pettus, Tex., which began operations recently. He has been with Stanolind since 1921, serving as engineer at the Luby gasoline plant, Bishop, Tex., as well as various other Stanolind plants in Wyoming, Louisiana, and Texas.

G. Schlicht, member of the managing board of Deutsche Erdoel, A. G., in Germany, is in the United States studying American drilling and production methods in the Gulf Coast area.

E. W. Riblett, M. W. Kellogg Co., has been transferred from New York City to Jersey City, to become associate director of petroleum and chemical-research laboratory.

L. P. Bristley, Jr., seismograph party chief for Gulf Research & Development Co., has been transferred to Vicksburg from Hazelhurst, Miss. He formerly was located at Monroeville, Ala.

Jack Pierce has joined the Billings, Mont., staff of Pure Oil Co. as a geologist, transferring from Illinois.

Lloyd F. Thanhouser, New York City, has been named general counsel for Continental Oil Co. at Ponca City, Okla., and **Burney Braly,** formerly general attorney at Fort Worth, has been appointed associate general counsel. Thanhouser succeeds **James J. Ccsgrove,** who will devote his full time to duties as chairman of the board.

R. M. Carter has been appointed superintendent of tankage for Stanolind Pipe Line Co., Tulsa, succeeding **C. E. Spencer** who resigned to join Keyes Tank & Supply Co., Provo, Utah. Carter formerly served as administrative assistant under **A. M. Hill,** superintendent of line maintenance.

Ross M. Archer, field foreman at Seminole, Okla., for The Texas Co., has been transferred in the same capacity to the Maysville, Okla., area.

Harold E. Murphree, Jr., head of the mechanical department section, Pan-American Refining Corp., Texas City, Tex., has been promoted to assistant department head, and **Sidney N. Smith, Jr.,** engineering department, has been named technical section head in charge of mechanical department planning and scheduling division.

Gerald A. Burton, seismologist at Casper, Wyo., for Shell Oil Co., Inc.'s, Rocky Mountain division, has been promoted to area geophysicist, and transferred to New Orleans. **Kurt F. Pilgrim,** administrative assistant at Los Angeles, has been promoted to exploitation engineer, Long Beach, for the Los Angeles Basin division.

William A. Matthews, geophysical supervisor, Rocky Mountain division, Stanolind Oil & Gas Co., has been named division geophysical supervisor for the company's foreign exploration department, Canadian division, headquartered in Calgary, Alta. He joined Stanolind in 1936.

William K. Whiteford, president of British American Oil Co., Ltd., Toronto, Ont., Canada, was recently elected to the board of directors of Canada Life Assurance Co.

Robert Womack, Jr., division development geologist, North Louisiana-Mississippi area, The California Co., Natchez, Miss., has been transferred to the development geology staff at New Orleans. He will be replaced in Natchez by **L. C. Powell,** geologist. Other changes include: **S. L. Kearl,** petroleum engineer, Lake St. John, La., transferred to the evaluations geology staff at New Orleans; and **J. R. Lynch,** petroleum engineer formerly with Richmond Exploration Co., named engineer at Rangely, Colo.

Wilmer J. Langlois has been promoted to foreman in the oil-movement department, Esso Standard Oil Co., at the Baton Rouge, La., refinery, and **G. R. Cranfill** has been placed on a special assignment in the equipment-inspection group. He is being replaced by **C. C. Lloyd** as head of the chemical-products inspection group. **G. M. Perkins** has been named head of metallurgical and welding-inspection group replacing Lloyd; and **W. H. Brock** has been named to replace Perkins as head of process equipment inspection group.

John B. Jared, Jr., engineering department, American Republics Corp., Houston, has been promoted to assistant chief engineer of the company.

George S. Dunham has been appointed vice chairman of the manufacturing committee, Socony-Vacuum Oil Co., Inc., and will supervise operations of the company's eastern and midwest refineries and pipe lines. He succeeds **Douglas L. Hooker,** who recently retired from active service.

Walter J. Levy has resigned as chief of the petroleum branch, Economic Cooperation Administration, to become an economic consultant with offices in New York City. He formerly was economic advisor to Socony-Vacuum Oil Co.

Pendleton Beall, superintendent of The Texas Co. refinery at Casper, Wyo., has retired and will be replaced by **A. E. Higgs,** now superintendent of the company's refinery at San Antonio and formerly assistant superintendent at Cody, Wyo. **H. C. Wakefield,** assistant superintendent of the Casper plant, will be transferred to El Paso, Tex., as head of the company's refinery there, and **E. W. McNealy,** process-engineering department of the company in New York City, will be transferred to Casper as assistant refinery superintendent.

Francis E. McIntyre, formerly a member of Stanford University's economics department, has resigned as assistant director of Office of International Trade, and has become a director of economic research for California Texas Oil Co., in New York City.

M. S. Wise, who has been district engineer for S. A. P. Las Mercedes in Venezuela, has joined American Overseas Petroleum Co. as assistant to the manager of operations and will soon leave for Sumatra to begin his new duties.

J. E. Bogk, manager of the refining department of Phillips Petroleum Co. at Bartlesville, Okla., has been appointed vice chairman of the operating committee. He joined Phillips as chief engineer of the Kansas City, Kans., refinery in 1929, and has remained in the refining department since that time. Prior to joining Phillips Bogk spent 5 years in municipal engineering and contracting.

Aubrey Weatherholt, formerly of Bartlesville, Okla., has been named district superintendent of the Oil Hill, Kans., area for Empire Pipeline Co., succeeding **C. A. Mason,** who recently retired. **Thomas J. Lanagan** has been transferred from Cushing, Okla., to Odessa, Tex., as district superintendent; **W. L. Kline,** assistant superintendent of the Ponca-Cushing, Okla., district, has been promoted to superintendent of the Cushing district; and **O. V. Adkins,** who has been in the Chico, Tex., area, has been named district superintendent of operations in North Texas.

Robert W. Pitcher has joined Pan American Production Co. as manager of the crude-oil department. He will be headquartered in Houston.

Douglas P. Bates, Esso Standard Oil Co., Bayway, N. J., has been named supervisor of acid treating and filtering operations of the white-oil plant, and **Louie E. Ehresmann,** connected with activities in alcohol modernization and expansion program, has been promoted to technical assistant to **Dick VanDijk,** head of the white-oil plant.

J. R. Webb, Drumright, Okla., gas engineer for Pure Oil Co., has been transferred to the Tulsa office as division superintendent of the gas department.

E. W. Showen, field petroleum engineer at Wickett, Tex., for Gulf Oil Corp., has been transferred to the Odessa, Tex., area as assistant zone petroleum engineer.

T. V. Moore, Standard Oil Development Co., New York City, and **H. G. Vesper,** California Research Corp., San Francisco, have been appointed chairmen of two American Petroleum Institute advisory committees on fundamental research. Moore succeeds **Earl G. Gaylord** as head of the committee on occurrence and recovery of

PERSONALS

petroleum, and Vesper succeeds **W. J. Sweeney** as chairman of the committee on composition and properties of petroleum.

Bruce H. Robinson, General Petroleum Corp., Los Angeles, has been elected chairman of the administrative committee of the Conservation Committee of California Oil Producers, and **C. W. Stephens,** Ohio Oil Co., has been named chairman of the new engineering board.

W. F. Squire, General Petroleum Corp., has been named manager of the Oregon division for the company; **Richard M. McEntyre** has been appointed assistant manager of the division, and **T. J. Gates** has been advanced to maintenance-control engineer at the Torrance, Calif., refinery.

Fred J. Hill, independent oil producer, has moved to the Midland, Tex., area and will devote his time to activities in the Permian basin. He formerly operated in Houston, and before becoming an independent operator was with Mid-Continent Petroleum Corp. at Tulsa and Shreveport.

T. R. Clements, Cities Service Gas Co., has succeeded **M. W. Hanna** as pipe line and compressor-station superintendent at Petrolia, Kans. Clements, former district pipe-line superintendent, Oklahoma City, has been replaced by **Archie Walstad,** who was promoted from foreman. **D. L. Lhuillier** has been transferred from the Pampa, Tex., station to an assignment as production engineer at the company's new North Hugoton compressor station near Ulysses, Kans.

H. Ben Cox, Houston, has been named superintendent of the land-lease department of Cities Service Oil Co. (Del.), replacing the late James C. Kennedy. Replacement of Cox at Houston has not been made.

Norton E. Fincher, bottom-hole pressure gage operator for Humble Oil & Refining Co., Houston, has been transferred to the Louisiana division, headquartered at New Orleans, in the same capacity.

John Suman, vice president, Standard Oil Co. (N. J.), New York City, has been named a member of a 19-man citizens committee to assist in arrangements for the United Nations Scientific Conference on Conservation and Utilization of Resources. The conference opens at Lake Success, N. Y., August 17.

Art Swanson, formerly drilling superintendent for the Shell Group in New Guinea, has joined Socony-Vacuum Oil Co., Inc., and will leave shortly for Venezuela following a leave in the United States. He previously worked in Venezuela and Colombia.

Walt Little, drilling superintendent for Tropical Oil Co. in El Centro, Colombia, S. A., has retired from active service with the company and is returning to the United States.

SHIFTS—

J. L. Creigh, engineer, Humble Oil & Refining Co., Corpus Christi to Pleasanton, Tex.; **Gene P. Coryell,** chemist, Petrol Refining Co., Galveston to Texas City, Tex.; **C. W. Becker,** Midwest Exploration Co., Wichita Falls, Tex., to Lander, Wyo.; **D. P. South, Jr.,** geologist, Transgulf Corp., Shreveport to Houston; **F. Dale Buerstetta,** engineer, Phillips Petroleum Co., Eureka, Kans., to Odessa, Tex.; **L. A. Bell,** superintendent, Sinclair Oil & Gas Co., Riverton to Bairoil, Wyo.

F. H. Callaway, engineer, Stanolind Oil & Gas Co., Tulsa to El Dorado, Ark.; **Arthur H. Petsch,** geologist, Ohio Oil Co., Guatemala, C. A., to Amarillo, Tex.; **Dr. J. Van Soest,** engineer, N. A. M. Shell, Colombia, S. A., to Oldenzaal, Holland; **Arthur Maddox,** engineer, Venezuela, S. A., to Tulsa; **Charles E. Hummel,** engineer, Standard Oil Co., N. J., Cambridge, Mass., to North Plainfield, N. J.; **V. U. Gaither,** foreman, Continental Oil Co., Gulfport to Hattiesburg, Miss.; **C. O. Magee,** engineer, Humble Oil & Refining Co., Columbia, Miss., to New Orleans; **Thomas V. Sheehan,** engineer, Standard Oil Co. (Ind.), Brooklyn to Hampton Bays, N. Y.; **R. S. Vickers,** engineer, Standard Oil Co. (Ind.), New York to Gary, Ind.; **Ellis Hogue,** superintendent, Park Oil & Gas Co., Louisville to Woodsfield, Ohio; **C. E. Ockert,** engineer, Sun Oil Co., Marcus Hook, Pa., to Chicago.

James J. Williams, engineer, Cities Service Oil Co., Wichita to Eldorado, Kans.; **Forrest L. Fry,** superintendent, Noble Drilling Corp., Mooncraft to Rock Springs, Wyo.; **Charles L. Heald,** geologist, United Geophysical Co., Rawlings, Wyo., to Edmonton, Alta., Canada; **R. A. Hockenson,** engineer, Ohio Oil Co., Chickasha, Okla., to Longview, Tex.; **Horace L. Temple,** engineer, Continental Oil Co., Ponca City, Okla., to Mound Ridge, Kans.; **M. C. Hoffman,** superintendent, Stanolind Oil & Gas Co., Tulsa to Shreveport; **Homer C. Holder,** Western Geophysical Co., Calgary, Alta., Canada, to Natchez, Miss.; **Charles Hornberger,** geologist, Sun Oil Co., San Antonio to Marfa, Tex.

Porter Montgomery, geologist, Stanolind Oil & Gas Co., Sweetwater, Tex., to Topeka, Kans.; **L. E. Ringer,** geologist, Advanced Exploration Co., Inc., Sweetwater, Tex., to Cleburne, Tex.; **D. C. Garrett,** superintendent, General Geophysical Co., Prescott, Ark., to Effingham, Ill.; **George V. Cohee,** geologist, U. S. Geological Survey, Ann Arbor, Mich., to Washington, D. C.; **H. W. Scheeline,** Standard Oil Development Co., East Orange to Elizabeth, N. J.; **J. L. Biles,** engineer, Socony-Vacuum Oil Co., Inc., Woodbury to Mountain Lakes, N. J.; **James R. Cameron,** engineer, Stanolind Oil & Gas Co., Gorham, Kans., to Columbus, Ohio.

R. L. Johnston, engineer, Shell Oil Co., Enid., to Centralia, Ill.; **Harlon E. Dixon,** engineer, Cities Service Oil Co., Oklahoma City to Russell, Kans.; **Douglas A. Campbell,** superintendent, Creole Petroleum Corp., Caripito, Venezuela, to Maracaibo, Venezuela.

DEATHS

William Howell, 68, retired veteran production employe and pump station operator, Empire Pipeline Co., Seminole, Okla., died recently in Bartlesville, Okla.

Lewis Anderson McKee, 64, purchasing agent for Standard Oil Co. of Pennsylvania, died July 31 in Hampton, Pa.

Herman S. Atchison, 68, who retired from Standard Oil Co. (N. J.) in 1946 as head of marine division in Baltimore, died in Baltimore July 29.

Louis Perry Stephens, 60, pumper for Cities Service Oil Co. (Del.), died in Holdenville, Okla., recently.

William Fowler, 54, stillman in the distillation and cracking department, Esso Standard Oil Co.'s Bayway, N. J., refinery, died recently.

J. B. Shank, 45, shift foreman for Sinclair Refining Co., Houston, died August 3.

A. B. Jenkins, 46, engineer for Phillips Petroleum Co., Borger, Tex., died August 3.

Alfred F. Boudreau, 60, president of Petroleum Trading & Transport Co., Tulsa, died August 4 in LaJolla, Calif.

Marcus W. Shriver, independent oil operator, died in Dallas July 30.

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Universal Service Protects Your Refinery

The California Co. Lays First

Offshore Pipe Line

In Current Gulf of Mexico Boom

by Leigh S. McCaslin, Jr.
District Editor

BAY MARCHAND AREA
SOUTH TIMBALIER AREA
THE CALIFORNIA CO
LA STATE MIN. BD NO. 482
LA STATE MIN. BD NO. 486
LA STATE MIN. BD NO. 1363
LA STATE MIN. BD NO. 1367
LA STATE MIN. BD NO. 1024
COLLECTING AND SEPARATING STATION (ON PLATFORM OF ABANDONED WELL)
CENTER OF AREA

Map showing installation details of the new pipe line, and relationship to the Louisiana shore line

FIRST offshore pipe line in the current Gulf of Mexico drilling boom —nearly 3 miles of 4-in. line—has been laid by The California Co. to its Bay Marchand field.

Bay Marchand field lies offshore of Lafourche Parish, Louisiana, and is about 60 miles south of New Orleans. Its pay sands lie around the largest piercement-type salt dome in the world. The dome is roughly elliptical in shape, measuring 6 miles across the short axis and 10 miles across the long axis. Development work has been carried on around the dome by The California Co. and Union Oil Co. of California. Union has drilled four deep, dry holes on the north flank and farmed out some of its acreage for a fifth test now being drilled by H. L. Hunt, the farmout operator. Phillips Petroleum Co. and the Continental combine (Continental Oil Co., Tide Water Associated Oil Co., Atlantic Refining Co., and Cities Service Oil Co.) also hold acreage in the area.

First well drilled by California in the area hit right on top of the salt dome as predicted by the exploration men. In fact, the drill hit salt within 15 ft. of the depth predicted by the geologists and geophysicists. With the dome located, the company built two drilling platforms flanking the first well at distances of 2,620 and 3,078 ft. Water depth in the area is approximately 30 ft. So far, two producers have been brought in on one of these platforms and three on the other. (See Table 1). Present estimates by geologists indicate that the field may be a major reserve. Further drilling will be necessary to more closely define its importance.

The pipe line was laid to supplant the relatively expensive transportation method of barging oil ashore, which was used initially.

Collecting, Separating Station

To provide a central offshore collecting and separation station, facilities have been installed on the platform which drilled the first well. Since it is located on the center of the dome it is ideally situated. Production facilities placed on the platform include:

Two 250-bbl. stock tanks to provide a sump for the pump moving the oil ashore.

Two 10-ft. by 30-in., 125-psi. separators.

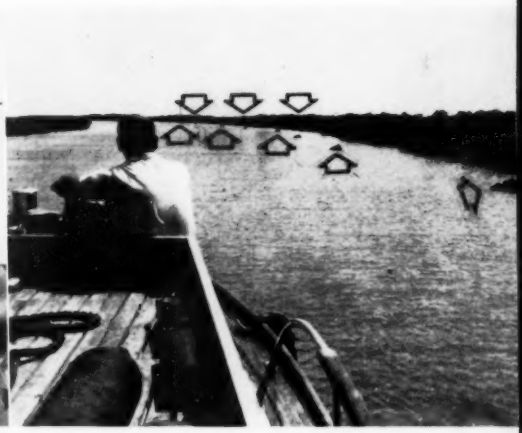
One 5 by 10-in. reciprocating pump driven by one 145 GK gas engine.

One 3-in., two-stage centrifugal pump driven by one six-cycle, 100-hp. gas engine.

Gagers' house.

One 10-well header.

Shore terminus of the line is located at the mouth of Pass Fourchon.



Left: D. D. Jackson, offshore superintendent, John Copeland, field engineer, and Ed Denzler, division engineer, discussing an offshore problem at the California Co.'s Grand Isle base. Building in background will provide additional office space for the California Co.'s district personnel on Grand Isle. Right: In preparation for stringing offshore, the 4-in. flow line was welded on the beach and then floated in Pass Fourchon by means of 55-gal. drum buoys. This view was taken from California Co. crew boat en route to offshore location. The man on the bow of the boat is Ed Denzler, division field engineer, Harvey, La.

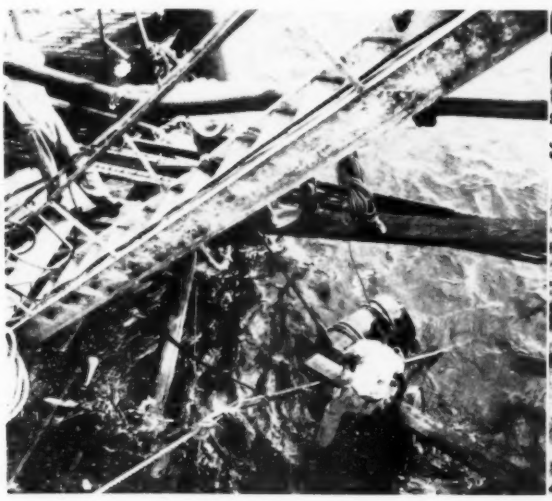
TABLE 1—WELL STATUS—BAY MARCHAND FIELD

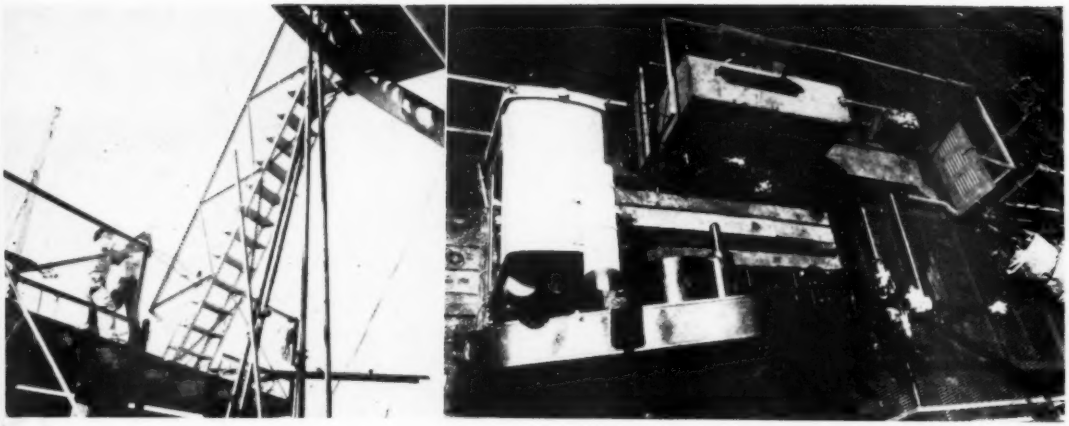
Wells	Total depth Ft.	Pay sand interval Ft.	Completion procedure	Initial prod. Bbl.	Tubing pressure P.s.i.	Gravity A.P.I.	GOR
B-1	3,718	2,873-2,910	114 holes 2,873-92'	250	250	26.6	571
B-2	5,449	2,875-3,010	Perf. 2,956-64 2,990-3,006 Set screen, gas lift	150		21.7	
B-3		Sanded up and temporarily abandoned					
C-1	5,700	5,041-69	Perforated	288	1,025	40.9	344
C-2	5,526	5,048-92	Perf. 5,048-62 5,076-92	320	1,060	41.9	350
C-3	5,034	3,891-4,005	Gravel pack in open hole 3,894-3,907½'	340	320	20	200

Presently, the production is flowing directly into barges at this point with the barges moving the oil to Avondale, La. Plans are being made to construct a tank farm of 60,000-bbl. storage capacity at the barge terminal.

Contractors for the first offshore pipe line in the postwar Gulf boom were J. Ray McDermott & Co., Inc., of Harvey, La., and Latex Construction Co. of Houston. Field supervisory personnel for Latex on the job include J. A. Cantrell, superintendent, and F. A. Silers, engineer. For The California Co., the operation came under the direction of the Harvey

Left: In this shot a 2-in. flow line from a producing well is being tied into the production platform. The two 55-gal. drums keep the end of the line afloat so that the rope-handling lines could be used to tie the pipe up to the structure. Right: After the 2-in. line was secure, a welder was called in to cut off the plug prior to hoisting the line up to the floor of the platform





Left: After the plug has been cut off of the end of the flow line, roustabouts use a block and tackle to raise the line up to the floor of the platform. Immediately to the right of the line being hoisted can be seen four previously installed lines. Right: A 145 GK gas engine pumps the produced oil from the production platform through the 3 miles of 4-in. line to shore. The standby unit in the background is a 3-in., two-stage, centrifugal pump. With this equipment, the California Co. can handle a daily production of around 7,000 bbl. Space remains on the right side of the platform for another line pump if necessary. The pump platform in the background was built on top of the triangular dolphin bumper which was installed originally as a buffer between the platform and the L.S.T. drilling barge

division office headed by Cecil Brown, division superintendent. His assistants include: Ed Denzler, division field engineer, D. D. Jackson, offshore superintendent, and John Copeland, field engineer for the pipe-line job.

Construction work on the 4-in. offshore line required 4 weeks (10 days of this time, however, were lost waiting for favorable weather). In preparation for stringing, the offshore part of the line was first welded together in three sections—900, 1,300, and 9,700 ft. These sections were floated in Pass Fourchon by means of 55-gal. drum buoys which were tied to the line with rope at 45 ft. intervals.

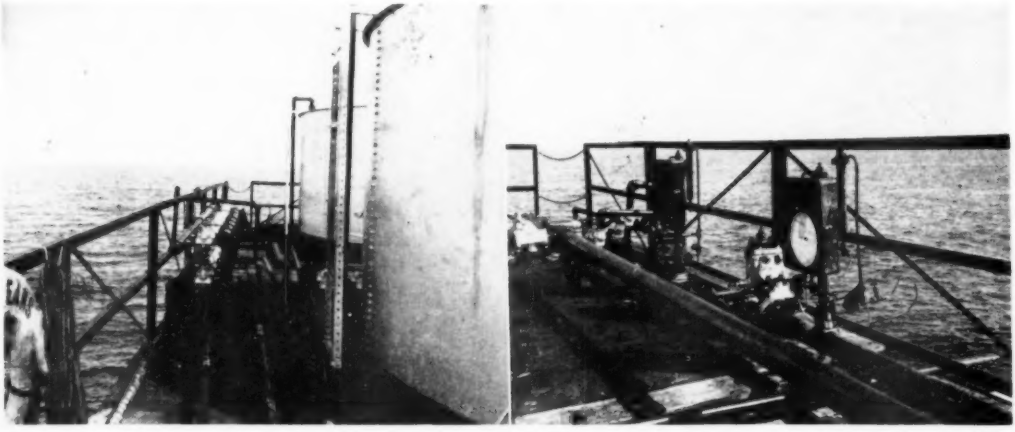
Welding of the joints was done on the beach. The 4-in. pipe consisted of random lengths of 10.79-lb. line pipe. It was coated and wrapped as follows: first a primer coat, then one coat of enamel, a felt coat, another of enamel, and finally a kraft paper wrapper.

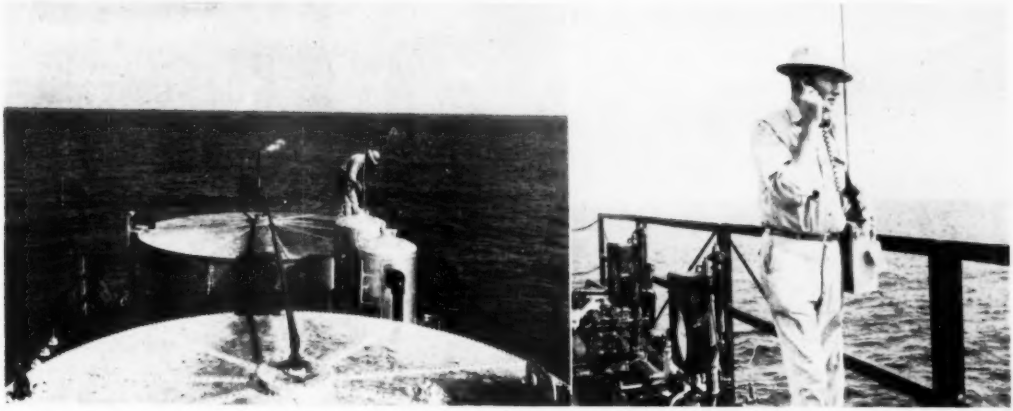
U. S. Engineer regulations prescribe that pipe lines must be buried 3 ft. when the water depth is less than 8 ft. For this particular job it was necessary to ditch out into the Gulf a linear distance of 400 ft. to conform with regulations. Because of the contour of the Gulf bottom it was actually necessary to ditch as deep as 5 ft. in some places.

Weather proved to be a serious deterrent to the ditching operations. The route of the line was ditched twice before the line was finally laid. On the first try, rough weather blew up before pipe could be laid, and filled the ditch with sand. The sand proved more difficult to remove than the soft, sticky, blue clay which had been ditched originally.

Taking advantage of good weather, the 4-in. line was actually pulled out into the water before a ditch was ready for it. The ditch was then dug alongside the line and a dragline used to pick the line up and lay it in the ditch.

Left: These two 250-bbl. stock tanks are located on the offshore collecting and separation station platform. The platform is an abandoned structure which was used by the California Co. to drill its first well in the area—a dry hole which hit the top of the salt dome. A 10-well header has been installed to provide for future producing wells. Right: These meters measure the gas produced from California's Bay Marchand oil wells. After separation from the oil at the production platform, the gas is piped back to the company's drilling wells for use as fuel gas





Left: C. L. Hargrave, California Co. switcher, gages one of the 250-bbl. stock tanks handling the company's Bay Marchand production. Flare jacket 150 ft. from producing platform may be seen just beyond the second tank. Right: California's sea-going gagers are equipped with a portable radio permitting communication with the producing wells as well as shore headquarters, if necessary. One gager is on the production platform at all times and each man works a 10-hour shift. The men are at sea for 7 days, then off 7 days

To lay the line, a 1,000-hp. tug and a 600-hp. tug were used. (The larger tug is a war-surplus L.C.T. converted by The California Co. for service operations in its offshore development work. The smaller tug was rented.) Three hours were required to tow the 11,900 ft. of offshore line into place. The 900-ft. section was towed out first and as its last joint passed the beach the 1,390-ft. section was welded on, and then similarly the 9,700-ft. length was tied in.

As the line crossed the beach, the 55-gal. drums used to float it in Pass Fourchon were cut off. As a result, the line was actually pulled along the bed of the Gulf into place. The line was pulled some distance past the offshore terminus (the production platform) before the towing was stopped. This was done to provide slack when the line was dropped. Two 55-gal. drums and a handling line had been placed on the end of the line before leaving shore to facilitate tying into the platform.

With the line in place, the engineers on the job anticipate little trouble. Although there are heavy currents in the area, they expect that the line will bury itself in the soft, sticky clay of the Gulf bed, thus protecting itself from the currents. As for corrosion, the wrapping used, plus insulating flanges at the two ends of the line, are expected to handle that problem. The possibility of installing cathodic protection for the line is being considered. A pig trap has been installed and it is planned to run a pig at least once a week to keep the line free of paraffin.

Pipe Welded Two Joints at Time

On the back section of the line running from the beach to the barge terminal, the pipe was welded two joints at a time and pushed into place with a tractor. This land section was 2,500 ft. long.

With the 4-in. line laid from the barge terminal to the production platform, it was then necessary to run flow lines from the producing wells to the platform. The distance to the producing wells was 2,620 ft. in one case and 3,078 ft. in the other. Two flow lines and a gas line have been laid from the central production platform to each of the two platforms with producing wells. The gas lines furnish separator gas to run the drilling engines on the two platforms.

All of these flow lines and gas lines are 2-in. pipe. Pipe is both seamless and lapweld and is wrapped to the same specifications as the 4-in. line to shore. In anticipation of many such future lines, The California Co. experimented with four different laying methods in putting down the 2-in. lines.

(Continued on page 96)

In the left of the picture is the collection and separation station which handles the production from the California Co.'s Bay Marchand field. A 3-mile pipe line connects the station with a barge terminal on shore. To the right is one of California's drilling wells. Two producers have already been brought in from the location

by R. B. Tuttle
Associate Editor

Here may be seen the general arrangement of equipment in Wood River Oil & Refining Co.'s new Cycloversion unit at Hartford, Ill.

Operational Flexibility Gained in Recent Additions to Wood River Refinery

TYPICAL of the operational flexibility required of today's refinery in meeting shifting demand patterns is the plant operated by Wood River Oil & Refining Co., at Hartford, Ill. This refinery, built in 1941, was designed originally to process a mixture of sweet and sour crudes in a Koch combination unit. Today the plant is being equipped with additional processes and the major portion of the crude oil now processed is a mixture of West Texas and Wyoming production.

The expansion and modernization program for the Hartford refinery includes fluid catalytic cracking, vacuum distillation, and a Perco Cycloversion unit. The cat cracker and vacuum-distillation units are under construction with completion scheduled for later this year whereas the Cycloversion unit was completed late last year. Upon completion of the units now being constructed all three of the new processes will be coordinated with existing facilities.

Since the Cycloversion unit has been designed to provide wide operational flexibility, four possible methods for its operation in conjunction with the other processes were and are being investigated. Full-capacity test runs extending over long periods have been made with the Cycloversion plant. The data obtained in these operations indicate how the unit may

TABLE 1

	Operation 1		Operation 2	
	Charge	Product	Charge	Product
Feed stock—	Sour gasoline		Sour gas oil	
Operating conditions:				
Feed rate, bbl. per day	7,200		3,600	
Space velocity, vol. vol. hr.	1.26		0.62	
Top catalyst temperature, °F.	985		965	
Catalyst-case inlet pressure, psig.	60		58	
Catalyst-case outlet pressure, psig.	58		54	
Steam, wt. per cent of charge			10.0	
Yield summary, per cent of charge:				
Gasoline, vol. per cent		91.0		33
Distillate, vol. per cent				27
Bottoms, vol. per cent		1.0		32
Gas, wt. per cent		9.5		7.8
Total liquid recovery, vol. per cent		92.0		92.0
Inspection data:		Gasoline		Gasoline
Gravity, °A.P.I.	56.4	60.2	28.1	59.2
R.v.p., psig.		10.6		12.0
I.b.p., °F.	116		434	
End point, °F.	570	396	670	396
Pour point, °F.			60+	
Flash point, °F.			186	
Total sulfur, wt. per cent	0.25		1.75	
Octane number:				
Motor method, 3 ml. TEL	68.5	80.8		79.0
Research, 3 ml. TEL		86.2		92.0
				Distillate
Gravity, °A.P.I.				33.5
I.b.p., °F.				410
Pour point, °F.				Below —20
Flash point, °F.				192
Color, N.P.A. number				$2^3/_4$
		Bottoms		Bottoms
Gravity, °A.P.I.		14.5		16.1
I.b.p., °F.		360		538
Pour point, °F.		—20		30+
Flash point, °F.				230+

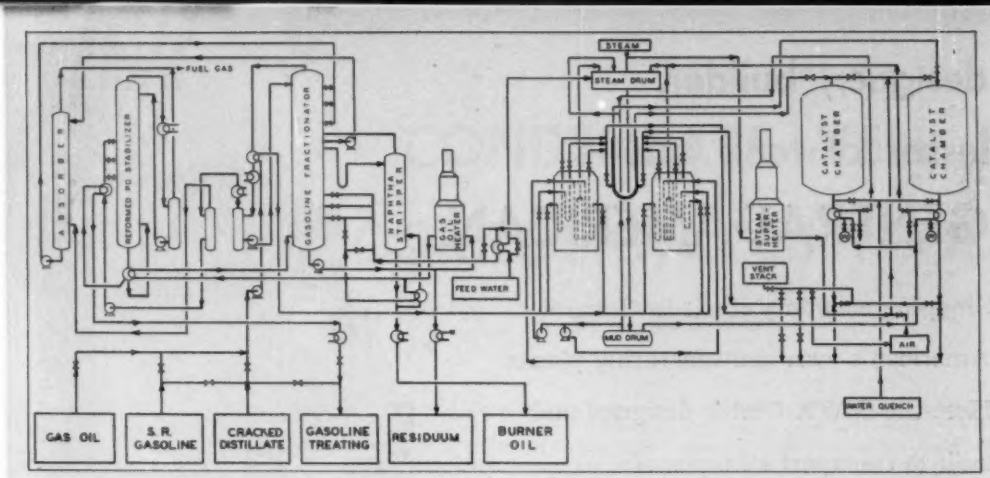


Fig. 1—Schematic flow arrangement of catalytic process as installed in the Hartford refinery of Wood River Oil & Refining Co.

be employed to operate when integrated into the refinery's new, modernized flow scheme. Substantial data are available for the processing of (1) sour straightrun gasoline, (2) sour gas oil, (3) cracked distillate, and (4) cracked distillate with recycle of side stream of catalytically cracked distillates. Conditions and results of these operations are given in Tables 1 and 2.

Operation 1 consisted of catalytically reforming straightrun gasoline. At a total liquid recovery amounting to 92 volume per cent of the charge (including 91 per cent gasoline and 1 per cent bottoms), the gasoline octane rating was improved by about 18 numbers to a research method rating of 86.2 with 3 ml. TEL per gallon. Fixed dry gas produced in the operation is 9.5 weight per cent of the charge.

TABLE 2—OPERATION 3—CHARGING REGULAR NO. 2 FUEL. OPERATION 4—NO. 2 FUEL FRESH FEED PLUS CAT CRACKED RECYCLE

		Thermal cracked only	Cat. cracked recycle	Cat. cracked recycle
Operating conditions:				
Fresh feed, bbl. per day		6,766	4,104	2,880
Recycle ratio			0.703	1.27
Total feed, bbl. per hour		6,766	6,984	6,240
Top catalyst temperature, °F.		1,010	1,010	1,015
Catalyst-case inlet pressure, psig.		67	66	60
Catalyst-case outlet pressure, psig		64	63	58
Steam, wt. per cent of charge		3.5	8.6	12.3
Yield summary, per cent of charge:				
Gasoline, vol. per cent		29.5	42.5	59.1
Distillate, vol. per cent		51.2	34.1	7.6
Bottoms, vol. per cent		10.1	7.2	18.0
Total liquid recovery, vol. per cent		90.8	83.8	84.7
Gas, wt. per cent		7.6	11.7	15.3
Carbon, wt. per cent		0.8	1.7	2.4
Inspection data:	Fresh feed	Gasoline		
Gravity, °A.P.I.	30.6	50.6	48.4	48.2
R.v.p., psig.	0.45	9.0	9.95	9.45
I.b.p., °F.	245	95	86	89
End point, °F.	627	414	435	425
Total sulfur, wt. per cent	1.17	0.19	0.379	0.364
Aniline point, °F.	102		68	
Octane number:				
Motor method, 3 ml. TEL		77.8	77.4	78.0
Research method, 3 ml. TEL		88.0	89.0	90.2
		Distillate		
Gravity, °A.P.I.		26.0	23.8	22.5
I.b.p., °F.		408	405	410
End point, °F.		575	572	555
Total sulfur, wt. per cent		1.45	1.93	1.80
Aniline point, °F.		77	63	
		Bottoms		
Gravity, °A.P.I.		11.0	12.0	12.0
I.b.p., °F.		368	466	466
End point, °F.		702	662	676
Total sulfur, wt. per cent		2.31		
Aniline point, °F.			27	10

In Operation 2, the Perco Cycloversion unit was used for catalytically cracking the sour gas oil. A 965° F. catalyst bed temperature was sufficient to yield 33 volume per cent of the charge as a 92 research octane gasoline with 3 ml. TEL per gallon. Fractionator sidecut distillate and bottoms were the remainder of a 92 per cent liquid recovery. As shown in Table 1, dry gas make for this operation was 7.8 weight per cent of the charge, accompanied by a deposition of carbon amounting to 1.72 weight per cent of charge.

The third Perco unit operation used thermally cracked distillate (regular No. 2 fuel) as charge stock. An 88 research octane gasoline (3 cc. TEL per gallon) yield of 29.5 volume per cent, based on charge, was obtained as part of the 90.8 per cent total liquid recovery. Dry gas produced in processing this cracked distillate was 7.6 weight per cent of charge.

Gas produced during these test operations was burned as plant fuel, since the polymerization unit had not been tied into the Cycloversion plant. The poly plant is expected to be placed in operation later this summer. When 10-lb. R.v.p. gasoline is produced, an absorber operating at unit pressure is utilized, sending butane-free gas to the refinery fuel system.

Data given in Table 2 on the fourth test operation of the Cycloversion unit shows that 59.1 volume per cent of the thermally cracked distillate charged to the unit has been converted to gasoline. This operation is performed by recycling a fractionator sidestream cut, which is catalytically cracked distillate. Two runs were made, using recycle ratios of 0.7 to 1 and 1.27 to 1. Total liquid recoveries were 83.8 and 84.7 volume per cent respectively.

(Continued on page 103)

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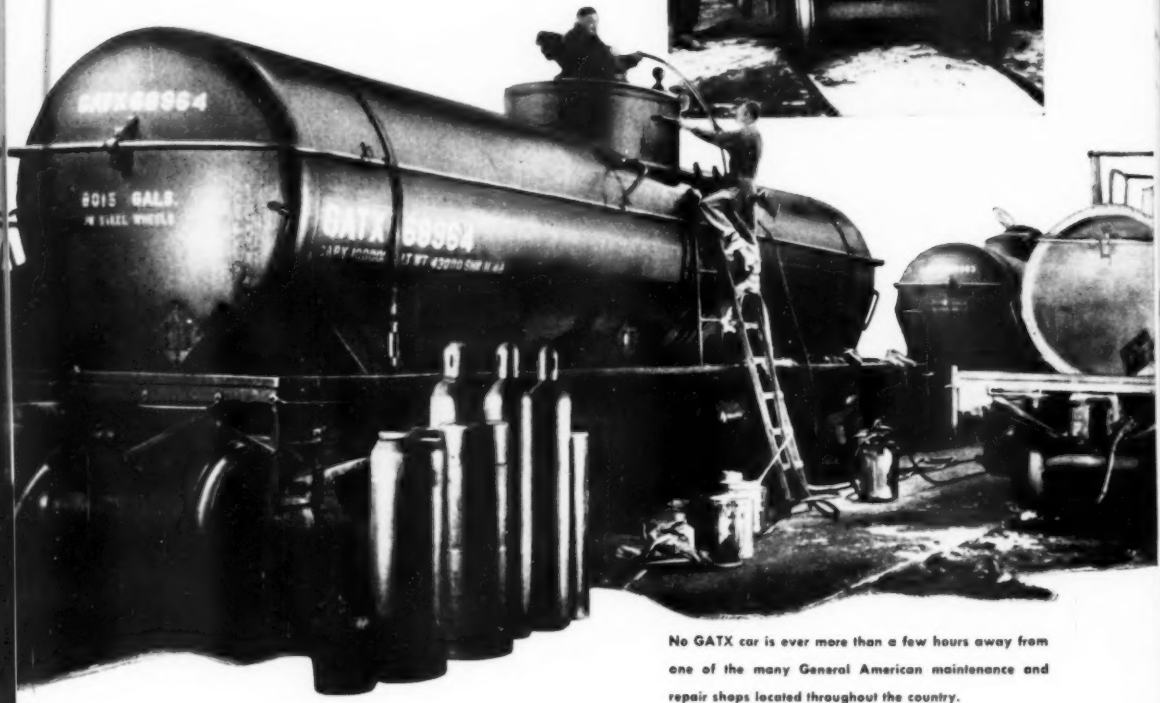

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USE OF NEUTRALIZING AGENTS FOR

CONDENSATE-WELL CORROSION CONTROL

by D. A. Shock

A laboratory apparatus is designed to determine pH values of carbonic acid solutions at various partial pressures of CO_2 up to 1 atm. pH values were determined on various solutions of acetic acid, sodium chloride, sodium acetate, and neutralizing agents, sodium carbonate, ammonium hydroxide, and magnesium hydroxide. Results indicated that pH values could be raised and maintained higher than 5.5 by addition of the neutralizing agents even with large excesses of CO_2 being available. Magnesium metal was found to function as a neutralizing agent, and a laboratory test showed its use reduced acetic acid and carbonic acid attack on steel coupons.

Injection of sodium carbonate into a corrosive well containing CO_2 concentrates of 1 atm., CO_2 and fatty acid of 100 p.p.m. was shown to keep the water above pH 6.0 at well-head conditions. Corrosion of the tubing thus protected was negligible.

The author is with the production laboratory of Continental Oil Co., Ponca City, Okla.

WHEN it became firmly established that condensate-well corrosion was due to acid attack, either lower fatty acids or carbonic or both, it was a logical step to consider the possibility of combating their attack by injecting alkaline agents into the well fluids to neutralize them. The success reported from the early use of neutralizing treatments was extremely erratic. Along with the variable results, several cases of plugged tubing were reported, so that operators were reluctant to try this means of combating corrosion. Besides the practical difficulties being experienced was the doubt that it would be economically possible to treat the wells producing CO_2 in appreciable quantities.

For instance, a well producing 10,000,000 cu. ft. of gas per day which contains 1 per cent CO_2 would require several tons of soda ash per day if all the CO_2 were to be neutralized. While it was realized that limiting solubilities would make it improbable that such an amount would be needed, it was evident that a definite economic limit might exist for use of neutralizers.

This limitation for high-CO_2-content wells, which were generally the most corrosive, would be a definite disadvantage. Also, it was evident that it was the precipitation of solids in neutralization treatment which plugged the wells. Since the use of neutralizers obviously holds advantages and several successful field applications were being made, a program of research was set up to study their general potential application.

Previous work had shown that the pH of the water under well conditions was related to the concentration of carbonic and acetic acids. The influence of temperature and pressure on the pH of acetic acid solutions is comparatively small. However, the concentration of carbonic acid, and consequently the pH, is affected by the solubility behavior of CO_2 gas, and therefore considerably altered by temperature and pressure, since the solubility of the gas varies directly with the partial pressure of CO_2, inversely with the temperature, and is practically independent of the total pressure.

Thus, by using mixtures of natural gas and pure CO_2, it should be possible to approximate pH values in an apparatus operating at atmospheric pressure for wells which contain up to 1 atm. partial pressure CO_2. Under conditions in wells containing up to 1 per cent CO_2 at 1,500 psi., or 0.5 per cent CO_2 at 3,000 psi., the pH behavior could then be checked. The fatty acid (acetic) presented no problem and its pH value could be checked by adding a known concentration to the solution under study.

Apparatus devised for the study is shown in Fig. 1. The solution on which the pH is to be made is placed in a container, "pH cell," which is a modified gas scrubber. A calomel and a glass electrode from a standard pH meter were inserted in the stopper of the gas scrubber along with inlet tube and vent and thermometer. The solution temperature is regulated by immersing the pH cell in a constant-temperature bath. The incoming gas is used to agitate the solution so that equilibrium conditions can be reached more rapidly than if a static system were used. In order to maintain a

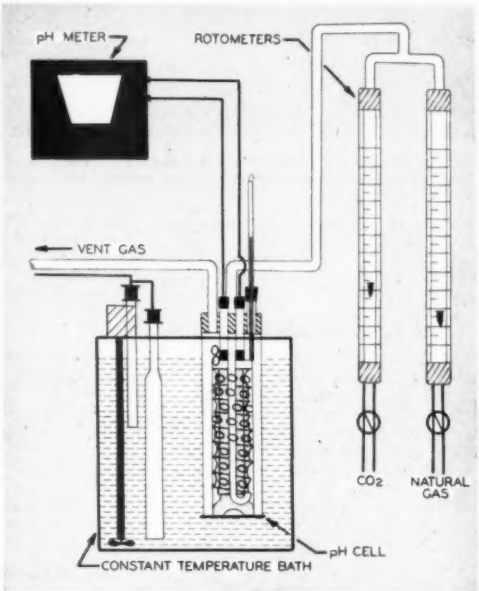
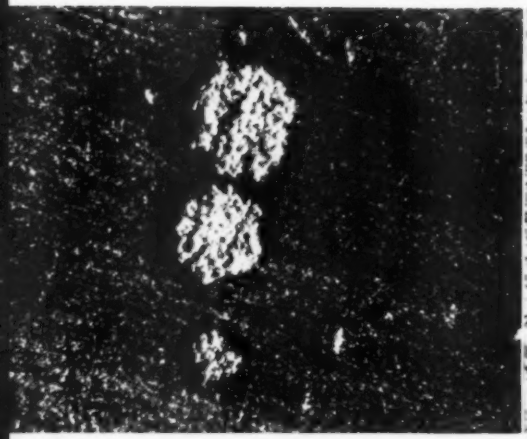


Fig. 1—Laboratory pH apparatus



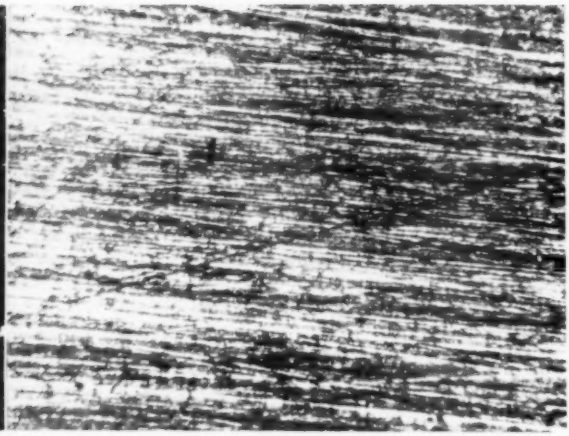
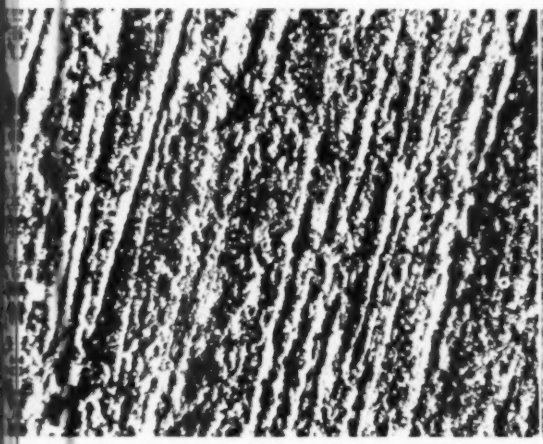


Fig. 2—(Left) Photomicrograph (50X) of S.A.E. 1020 steel coupon subjected to corrosion from carbonic acid. Fig. 3—(Right) Photomicrograph (50X) showing protection afforded coupon from carbonic acid corrosion, via solution of ionic magnesium. Test conditions are described in article



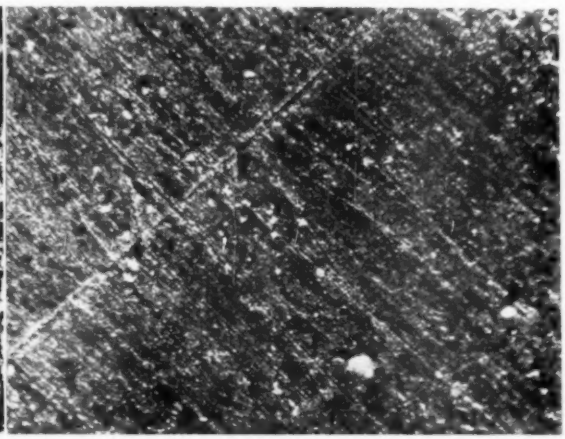


Fig. 4—(Left) Photomicrograph (50X) showing effects of attack from acetic acid (200 p.p.m., 130° F.). Fig. 5—(Right) Photomicrograph (50X) showing protection of coupon from acetic acid which has had magnesium material added. Test conditions same as for Fig. 4

known partial pressure under flow conditions, the gases are passed through rotometers.

Thus, the partial pressure is controlled by regulating the ratio of velocities of the incoming gases. The gas velocity through the pH cell is kept relatively constant at about 400 cc. per minute. The pH values are read on the pH meter in the usual manner, being sure that time enough has elapsed for equilibrium conditions to be established. The pH values should remain constant when equilibrium is reached.

The electrode system used was the standard glass-calomel electrodes furnished for industrial-type pH instruments. High-temperature electrodes were used for temperatures above 122° F. The machine was equipped with temperature compensator so that the values obtained should represent pH values which have been temperature corrected, and should be within 0.1 pH unit, reproducible within 0.05 pH unit.

pH Values of Salt Solutions

Since it was possible that the solubility of CO_2 may decrease enough to change the pH appreciably as the soluble salts content increased, a series of pH values were taken for NaCl and Na_2SO_4 in concentrations up to 10,000 p.p.m. The results of the survey are shown in Table 1. The pH values in distilled water are given for comparison. It is evident that neither NaCl or Na_2SO_4 in concentrations up to 10,000 p.p.m. change the solubility enough to raise the pH appreciably. These data indicate that the addition of soluble salts of strong acids and bases would be of little value as injection agents to limit CO_2 solubility.

TABLE 1—pH OF CARBONIC ACID SOLUTIONS IN SALTS AT 130° F.

	pH of CO_2 solutions	
NaCl (p.p.m.)	0.5 atm.	1 atm.
500	4.34	4.07
1,000	4.48	4.06
5,000	4.58	4.05
10,000	4.61	4.04
Na_2SO_4 (p.p.m.)		
500	4.58	4.17
1,000	4.62	4.19
5,000	4.61	4.29
10,000	4.72	4.37
Distilled H_2O	4.45	4.10

pH Values of Sodium Acetate

Since almost all corrosive condensate-well waters contain some lower

fatty acid, the neutralized salt of the fatty acid would be contained in any water treated with a neutralizing agent. These salts may be expected to have some buffering action. Sodium acetate was chosen for study since acetic acid is representative of the fatty acids and the sodium bases would be representative of inexpensive neutralizers.

The results of the survey are shown in Table 2. The sodium acetate was

TABLE 2—pH OF CARBONIC ACID SOLUTIONS IN Na ACETATE AT 130° F.

P.p.m.		pH of CO_2 solutions	
Na acetate $3H_2O$	Acetic acid equivalent	0.5 atm.	1 atm.
113	50	5.22	4.83
341	150	5.43	4.87
454	200	5.45	5.00
681	300	5.48	5.08
H_2O		4.45	4.10

used in concentrations to be equivalent to the neutralized acetic acid values shown. These results show that the pH is raised appreciably by the presence of sodium acetate solutions in relatively weak concentrations. Thus, by neutralizing a 300-p.p.m. acetic acid water, the pH would be raised to 5.48 for 0.5 atm. CO_2 5.08 for 1 atm. These are compared to the carbonic acid solutions of 4.45 for 0.5 atm. and 4.10 for 1 atm., a rise of approximately 1.0 pH unit.

pH Values from Use of Excess Neutralizer for Fatty Acid

Since the presence of the buffering salt of sodium acetate definitely raised pH of the carbonic acid solutions, several solutions were checked in which additional neutralizing agent was left to react with the dissolved carbonic acid. A solution of 200 p.p.m. acetic acid was neutralized, CO_2 was passed through first at 0.5 atm., then at 1.0 atm. at 130° F., and the values noted. For the effect of excess neutralizing agent, 10 times the amount required to neutralize the acetic acid solution was gassed with CO_2 and these results compared. The neutralizing agents thus studied were sodium carbonate, ammonium hydroxide, and

TABLE 3—pH OF CARBONIC ACID SOLUTIONS IN MIXED ACETATE CARBONATE SOLUTIONS

	pH of CO_2 solutions	
Neutralizer NH_4OH—	0.5 atm.	1 atm.
200 p.p.m. acetic acid solution neutralized	5.25	4.88
10x neutralizing amount	6.44	6.14
Sodium carbonate—		
200 p.p.m. acetic acid solution neutralized	5.37	5.01
10x neutralizing amount	6.86	6.02
Magnesium hydroxide slurry—		
200 p.p.m. acetic acid solution neutralized		4.64
10x neutralizing amount		6.05

magnesium hydroxide slurry. The results are shown in Table 3.

From this work it is concluded that a sufficient excess of basic sodium, ammonium, and magnesium compounds over the fatty acids present is capable of either limiting the solubility of CO_2 or buffering the solution so that the low corrosive pH values are not reached up to partial pressures of 1 atm. CO_2. The amounts of neutralizer required, according to these amounts, is comparatively small and definitely within economic limits. It is concluded that, under these conditions, a relatively small amount of alkali metal and alkaline earth bicarbonate formation keeps the pH from getting very low even with a very large excess of CO_2.

Use of Magnesium Metal as Neutralizer

The experiment using magnesium hydroxide slurry to raise the pH of the carbonic acid-acetic acid solutions showed that the formation of magnesium acetate and bicarbonate was effective. The insoluble magnesium hydroxide slurry cleared slowly, forming soluble magnesium salts.

Use of basic magnesium compounds is of interest in that there would be the least likelihood that insoluble basic compounds would precipitate and plug the tubing. Thus, local high pH zones where the neutralizer is injected would be eliminated. The basic magnesium compounds are insoluble in water, consequently their injection into the well fluids as a slurry may make their use unsuited for injection treatment. However, if solid forms could be placed in the well, a useful treatment method might be developed. It was believed that magnesium metal would serve very well for experimental purposes since it represented a readily available solid form which would act as a neutralizing agent.

An evaluation of the effectiveness of the magnesium was made by using the pH vessel shown in Fig. 1 as a corrosion test container. Tests were made on coupons prepared from S.A.E. 1020 steel strip cut ½ by 3 in. so that they could be suspended in the center well of the vessel. The surfaces were abraded on a rotary belt emery to remove surface oxidation products and to give a uniform surface. Tests were made on a 200 p.p.m. acetic acid solution which was agitated by passing natural gas through the cell, and on the carbonic acid solution resulting from 1 atm. CO_2 at 130° F. in distilled water. The exposure time was 24 hours. The average penetration was calculated from the weight loss on the descaled samples after microscopic examination was made of the surfaces. The evaluation of magnesium addition was made by placing a small piece of electrolytic magnesium metal in the bottom of the test vessel and inserting the steel coupon as before. Table 4 shows the comparative I.P.Y. (inches per year) values obtained by these experiments.

The results show that the addition of magnesium metal reduces the corrosion rate appreciably; however, there was still some attack taking place. Photomicrographs of the coupons demonstrate the corrosive attack and the protection afforded better than a comparison of penetration values.

Fig. 2 shows a photomicrograph taken at 50x of the coupon subjected to the CO_2 attack. This photomicrograph is typical of CO_2 corrosion where the attack is not uniform and is accelerated in the pitted areas shown in the center of the photograph.

Fig. 3 shows the coupon from the corrosive CO_2 solution in which the magnesium metal was placed. There is little evidence of attack and no pitting has taken place.

Fig. 4 shows the coupon from the acetic acid solution. The general roughening of the surface, particularly along the scratch lines, and lack of pits are typical of acetic acid attack.

Fig. 5 shows the photomicrograph of the coupon in acetic acid which had the magnesium metal added. It is evident that the attack has not been severe, although the corrosion products are thicker on this coupon than on the others. The corrosion is less than when no magnesium is added.

These laboratory results indicate that magnesium metal or basic magnesium compounds would be useful in reducing the corrosion rate by neutralizing the acids. It is to be noted that the rates were not reduced to a negligible quantity. This could well have been due to the design of the apparatus and the method of evaluation. The comparative photomicrographs show favorable results.

Field Application

From the laboratory data developed, it would seem that the use of neutralizers for combating condensate-well corrosion has a theoretically sound basis for economic application. Its use will depend largely on the

TABLE 4—CHANGE OF CORROSION RATE BY MAGNESIUM ADDITION

	I.P.Y. mild steel	
Corrodent —	Alone	+ Mg metal
20 p.p.m. acetic acid, 130° F.	.018	.001
Carbonic acid (partial pressure 1 atm.), 130° F.	.011	.002

various factors which must be considered in any of the corrosion-treatment methods and its success will depend on how well the factors are known and have been considered. A complete discussion of treatments cannot be made here; however, several obvious requirements for neutralizing treatments can be stated.

Most neutralizing treatments require liquid injection; this means some method of lubricating adequate chemical solution so that the acids will be neutralized, local high pH with insoluble salt precipitation will not take place, and liquid water will be maintained above the injection point so that dehydration plugging does not take place.

Sodium carbonate has been successfully employed for some time to alleviate corrosion in one of the corrosive condensate fields where the partial pressure of CO makes carbonic acid attack a definite factor. The wells operate at total pressure of approximately 2,300 psi. at about 150° F. The CO_2 content of the gas is approximately 0.7 per cent; thus the partial pressure of CO_2 is around 1 atm.

TABLE 5—EFFECT OF INJECTED Na_2CO_3 IN CORROSIVE WELL

	P (psi.)	T (°F.)	Partial pressure CO_2	pH at well head	P.p.m. Fe	P.p.m. organic acid as propionic
No treatment	2,425	172	1.16	4.5-5.0	17	90
Na_2CO_3 treated	2,355	167	1.12	6.0+	9	104

The water produced contains relatively small amounts of dissolved salts, the chloride content being 100 p.p.m. or less, and in amounts in the order of 2 bbl. per day per well. Table 5 gives the data for two wells from the same zone operating under similar conditions, one being treated with soda ash, and the other untreated.

The untreated tubing had been plastic coated so that contact of the produced water with the tubing was minimized. Using the apparatus described in a previous article,[1] the pH at well-head conditions was determined along with the iron content and fatty acid content. The fatty acid content shown is the total organic acid, neutralized or free in the water and calculated to propionic. These results show that the carbonate treatment is effectively raising the pH under well conditions to a value of 6.0 or above. The iron content and coupon exposures in the well show that no corrosion is taking place in the treated well.

As yet the data on field operation using solid neutralizing agents or magnesium is insufficient for reporting. Stick forms of sodium bicarbonate are being used and the use of containers filled with magnesium metal have been prepared.

Conclusions

1. It is possible to raise the pH of solutions exposed to unlimited CO_2 by adding basic compounds of sodium and magnesium. The amounts required are relatively small, not outside the economic limit for treatment costs.

2. Sodium chloride and sodium sulfate are not effective for this use.

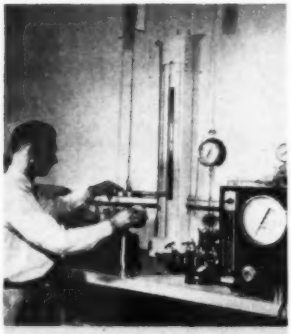
3. Sodium acetate has some effect and its presence would aid in raising the pH when formed due to the neutralization of the fatty acids.

4. Magnesium metal can be used to neutralize these acids. Coupon tests show that the attack on steel is decreased by its addition to the acid solutions.

5. Field use of injecting sodium carbonate shows that pH values can be raised to 6.0 under well conditions, and corrosion practically eliminated in corrosive well waters containing appreciable organic acid and carbonic acid.

Reference

1. "Determination of pH in Produced Waters from High Pressure Gas Condensate Wells," D. A. Shock, World Oil 128, No. 3.



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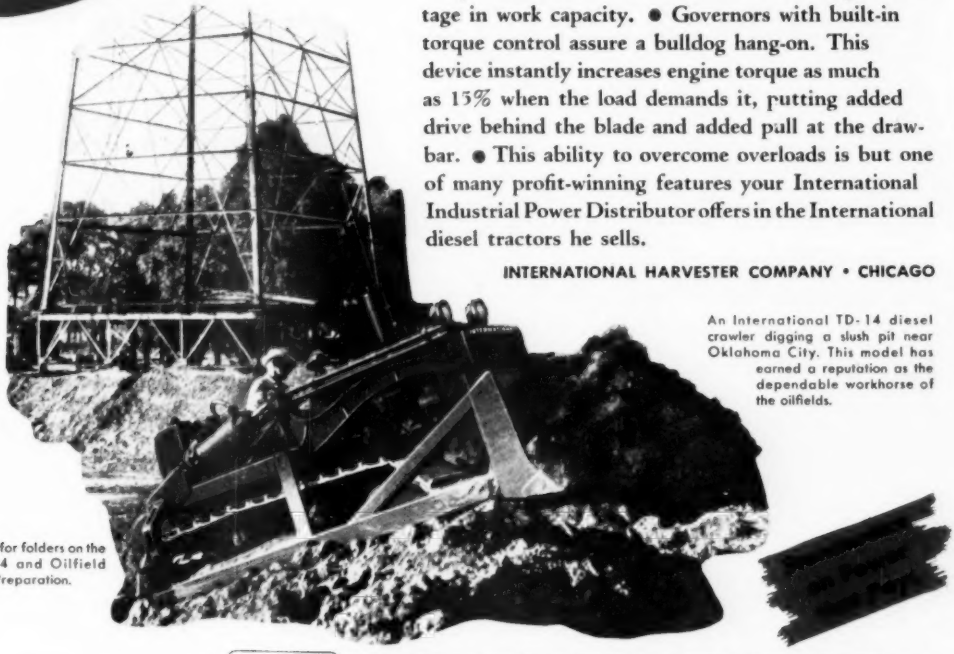

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Octane Climb Still Continuing, B. of M. Report Shows

by O. C. Blade*

A CONTINUATION of the slight upward trend in octane numbers of motor gasolines in the United States is indicated by the results of the Bureau of Mines national motor-gasoline survey for the winter 1948-49. Average octane values (motor and research methods) are well above those of the winter of 1944-45; they are not as high as those of the winter 1945-46 when wartime restrictions were removed, but the three winter surveys following, including 1948-49, have shown successive small increments in octane number.

Premium-price gasolines have an average motor-method octane rating of 79.7, compared with 79.4 for the winter of 1947-48, and with 78.5, 80.9, and 75.1 for the preceding three winters, respectively. Regular-price gasolines have an average octane number of 75.6, compared with 75.3 for the winter before, and with 75.0, 75.9, and 70.2, respectively, for the three preceding winters.

Average research-method octane number of premium-price motor fuels is 86.5 for the survey just completed. This compares with 86.2 for the winter of 1947-48, and with 85.0, 87.7, and 80.5 for the preceding three winters, respectively. The average research octane value for regular-price gasolines is 80.5, and compares with 80.2 for the winter before, and with 80.1, 81.7, and 74.2, respectively, for the three winters preceding.

Motor fuels also are somewhat more volatile than those of recent years. The average Reid vapor pressure of premium-price motor fuels during the past winter is 10.4 lb., which compares with 10.2, 10.1, 10.0, and 9.0 lb., respectively, for the four preceding winters back to 1944-45. The average vapor pressure of regular-price gasolines is 10.2 lb., compared with 10.1, 10.1, 9.8, and 8.2 lb. for the same winters, respectively. The average figures from the distillation data in the present survey indicate only small changes compared with data from surveys of the three years preceding.

Comparisons for Period

These data reflect the most important trends in the quality of winter motor gasoline since the close of the war and advent of more settled conditions. The accompanying table of average values and the set of charts illustrate the comparisons for this period, as well as comparisons with the gasolines sold during the last year of the war and the first postwar winter.

Data compiled on other tests included in the present survey and their average values are: Gravity, 62.5° A.P.I. for premium-price and 62.0° A.P.I. for regular-price gasoline. Corrosion, negative for all but two of the samples tested. Sulfur content, 0.076 per cent for premium, and 0.092 per cent for regular-price motor fuel. Gum-test results, 2.2 mg. per 100 ml. for premium, and 2.1 mg. per 100 ml. for regular-grade gasoline. Tetraethyl lead contents, 1.88 ml. per gallon and 1.35 ml. per gallon for the two grades, respectively.

The survey is a continuation of the series of semiannual reports made for winter and summer seasons since 1935. It was done under a cooperative agreement between the American Petroleum Institute and the Bureau of Mines, U. S. Department of the Interior.

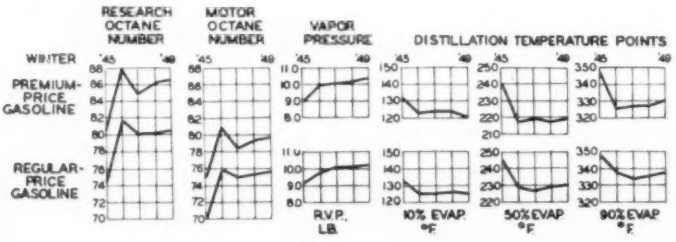
Samples of motor fuel were collected for this survey by participating companies during three winter months. The samples were tested in the laboratories of 25 oil and motor companies and represent the products of approximately 130 companies marketing gasoline. They were taken at filling stations in 235 cities and towns throughout the country.

The report includes charts for both winter and summer seasons that show the trends of octane numbers, Reid vapor pressure, and three important distillation points for the series of gasoline surveys. The map in the report shows the 17 marketing districts of the country and 162 selected locations with the respective numbers of samples indicated. A free copy of the report may be obtained by writing to the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh.

*Associate petroleum chemist, U.S.B.M. Report of Investigations 4567.

SUMMARY OF PRODUCT DATA FOR PAST FIVE YEARLY PERIODS

Winter	Octane number—Research	Octane number—Motor	R.v.p. lb.	10 per cent evap. °F.	50 per cent evap. °F	90 per cent evap.° F.
Premium-price Gasoline						
1944-45	80.5	75.1	9.0	132	241	348
1945-46	87.7	80.9	10.0	123	218	326
1946-47	85.0	78.5	10.1	124	220	327
1947-48	86.2	79.4	10.2	124	218	327
1948-49	86.5	79.7	10.4	121	219	330
Regular-price Gasoline						
1944-45	74.2	70.2	9.2	133	245	348
1945-46	81.7	75.9	9.8	125	229	338
1946-47	80.1	75.0	10.1	125	227	334
1947-48	80.2	75.3	10.1	126	229	335
1948-49	80.5	75.6	10.2	125	230	337



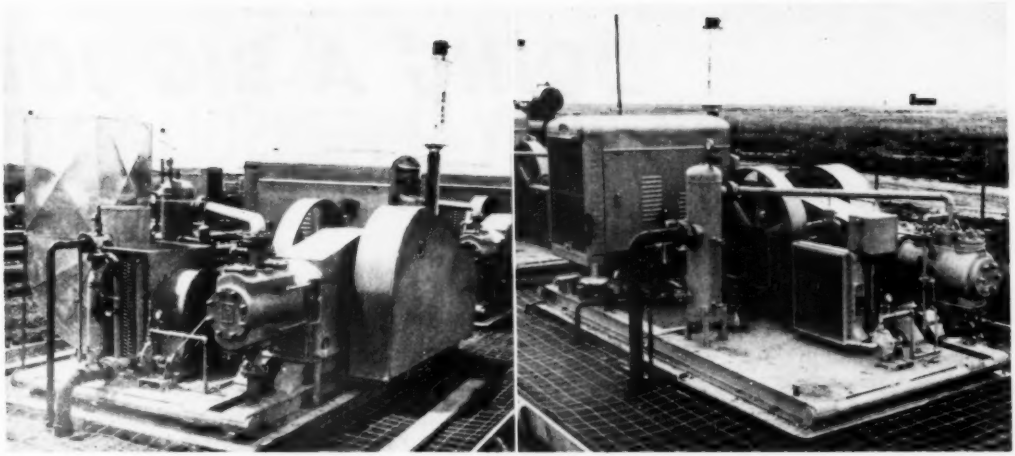
BOOKS

SUBSURFACE GEOLOGIC METHODS Published by Colorado School of Mines, Golden. 826 pp. $6 in paper binding, $7 in fabrikoid.

This is a symposium that represents a distinct contribution to geological literature, because it includes, in one volume, discussions in detail of 43 major topics that have hitherto been scattered through many sources. In addition to the well-known items such as electric and radioactive logging, core analysis and so on, newer or lesser-known items are discussed, such as detrital mineralogy, petrofabric analysis, multiple differential thermoanalysis, and spectrochemical sample logging. The volume was compiled and edited by L. W. LeRoy and Harry M. Crain, of Colorado School of Mines.

PETROLEUM RECOVERY CONFERENCE Bulletin No.A&M-1, published by Texas Petroleum Research Committee.

This large mimeographed volume presents the program and papers presented at the petroleum recovery conference at Texas A. & M. College April 6-8, 1949. Sixteen papers are published on a wide variety of topics, including: Railroad Commission's function in increasing oil recovery, significant research projects, return of salt water to the Woodbine sand in East Texas, secondary recovery, water flooding, gas repressuring, and others. Authors are oil-company engineers, university professors, service-company technicians, government bureau representatives, and independent producers



Left: Low-stage, 50 to 200-psi., compressor unit in Richard King field. The air-cooled gas intercooler is shown in front of the air blower. The air scoop in front of the radiator was installed to divert heated air upward, away from the front of the engine radiator. Right: High-stage compressor units boost the gas from 200 psi. to a discharge of 700 psi. The units are also identical to the low-stage units except that the compressor cylinders are 5¾ by 13 in. as compared with 9½ by 13 in. the low-stage compressors

New Southern Minerals Plant Handles

6,000,000 Cu. Ft. of Low-Pressure Gas Daily From Southwest Texas Field

by D. H. Stormont
District Editor

IN Richard King field of Nueces County, Southwest Texas, some 6,000,000 cu. ft. of casing-head gas daily which formerly was being flared today is being gathered and compressed for main-line transmission. The gas-conservation project, undertaken by Southern Minerals Corp., was made more attractive economically through use of portable or "package type" multicylinder-engine-driven compressors.

The new Southern Minerals installation is thought to be the largest portable compressor plant in such service in the United States oil industry. The type installation—high-speed multicylinder gas engines mounted on skids with single-stage compressors—was decided upon primarily because of its low cost. Total installation cost per installed horsepower (A.P.I. rating) was only about $150.

In addition to the low-cost factor, the portable compressors were well adapted to an installation of this nature because of the degree of flexibility offered in their operation. Ease of maintenance and their high salvage value also fitted the requirements of the project very well, as will be discussed later.

Richard King field is almost wholly owned by Southern Minerals, the company operating 75 of the 79 producing oil wells in the field. Discovered in November 1937, oil production is obtained from several reservoirs at depths between 5,200 and 5,700 ft. The upper 5,400-ft. sand, a solution-gas-drive reservoir, has been under pressure maintenance since August 1946. All gas from this sand, totaling about 1,700,000 cu. ft., plus about 1,000,000 cu. ft. of extraneous makeup gas, has been injected daily into the reservoir.

38 Wells Not Connected

When the pressure-maintenance project was placed in operation, only leases furnishing gas at separator pressures of 75 to 110 psi. were tied into the plant. Some 38 wells, on 8 leases, having lower separator pressures and about 2 miles from the plant site were not connected to the gas-gathering system because of the additional gathering and compression expense.

Under the planned schedule of operations it was thought uneconomical to install the required low-pressure compressor capacity because of the relatively small volume of gas involved. The gas output of these leases would have had to be raised from about 40-60 psi. to the plant inlet pressure of 100 psi. Also, a low-pressure gathering system would have been necessary. These wells, therefore, were not connected so that their gas production was flared at the tank batteries. This practice continued until early in July, at which time the portable compressor plant was placed in operation.

The station consists of eight engine-compressor units, four operating in the low-stage and four in high-stage service. The first-stage units compress the gas from an intake pressure of about 50 psi. to a discharge of 200 psi. The high-stage units boost the pressure on up to 700 psi., at which the gas feeds into Southern Minerals

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Yes—the EIGHT Wilson Supply - Ingersoll-Rand "Packaged" Portable Booster Compressors shown below are doing a BIG JOB in a South Texas field—delivering 918 Compressor Horse Power, handling 6,000,000 cu. ft. of gas daily.

With these compressors, the operator is getting two-stage compression with Single Stage Booster Compressors.

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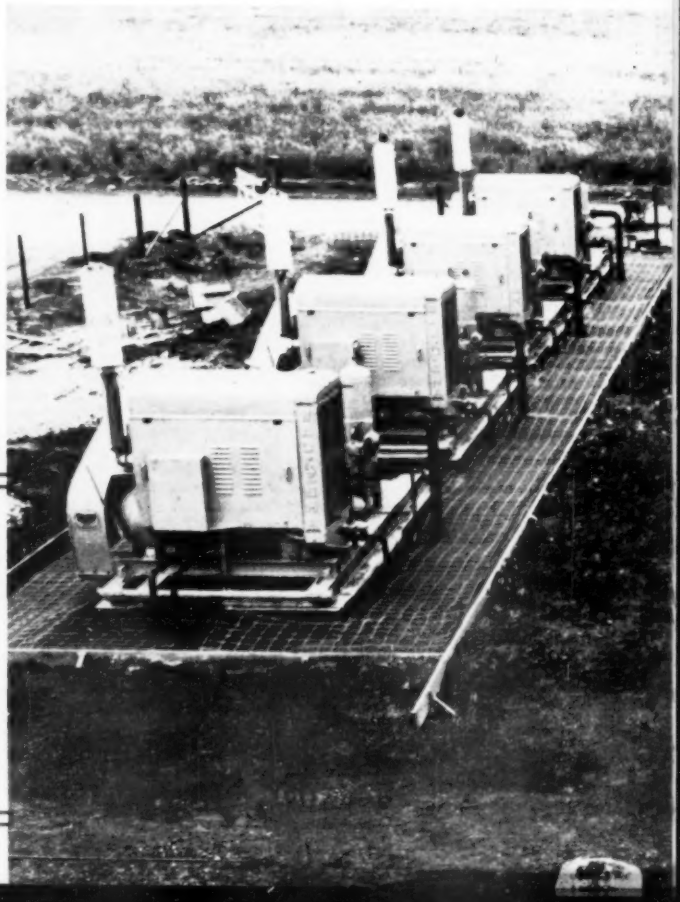

What are your needs? Check the sizes and specifications of the eight machines listed at the top of opposite page and see if one of these Wilson Supply - Ingersoll-Rand "Packaged" Portable Compressors cannot save you money.

Contact your nearest Wilson Supply Company Store or write "Compressor Division", Wilson Supply Company, P. O. Drawer 19, Houston, Texas, for detailed information, and quotations. Please give suction and discharge pressures and volume to be handled.

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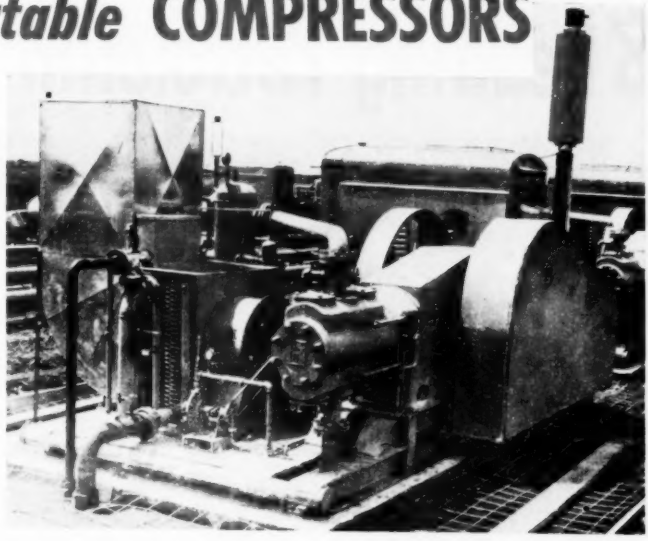
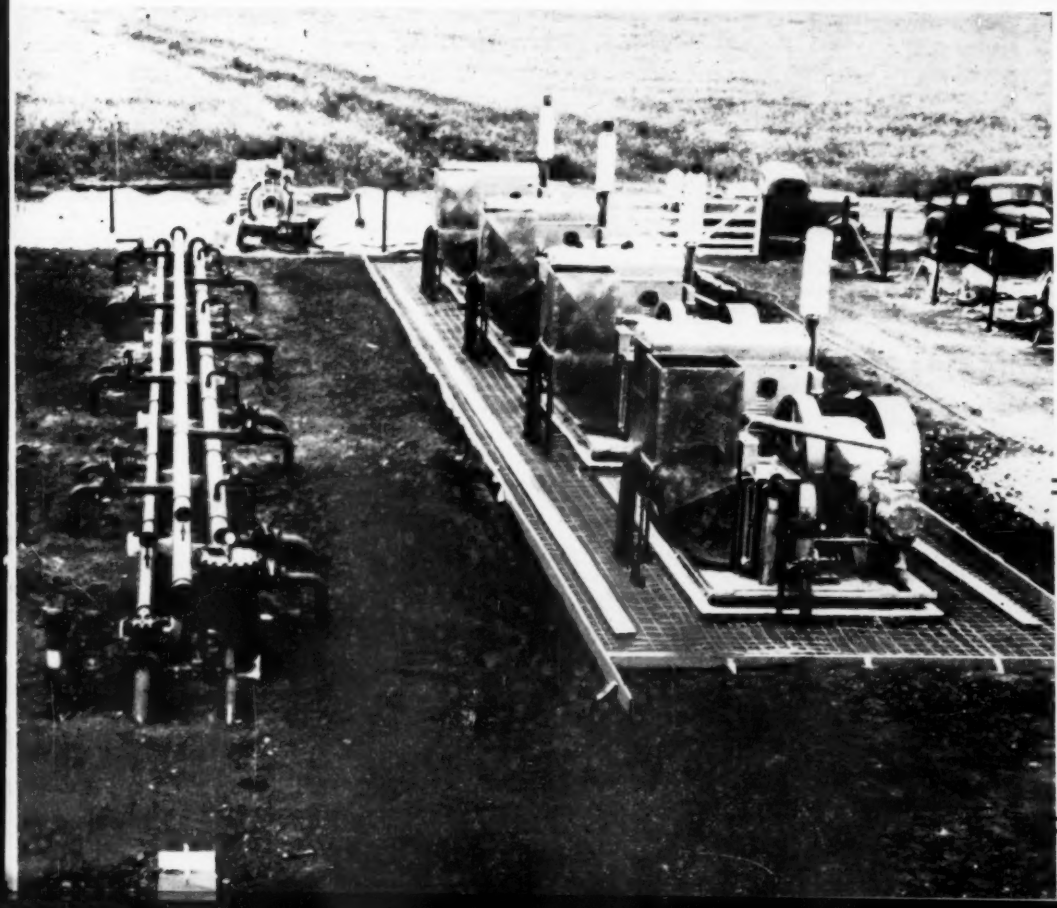
3. 8"x4⅛"x9"—75 H.P., 20-Lb. Suction, 700-Lb. Discharge, 382,000 Cu. Ft. Per Day.
4. 7"x4⅛"x9"—80 H.P., 40-Lb. Suction, 600-Lb. Discharge, 547,000 Cu. Ft. Per Day.
5. 9"x4¼"x9"—80 H.P., 10-Lb. Suction, 500-Lb. Discharge, 405,000 Cu. Ft. Per Day.
6. 4⅛"x9"—45 H.P., 200-Lb. Suction, 600-Lb. Discharge, 630,000 Cu. Ft. Per Day.
7. 3½"x11"—85 H.P., 800-Lb. Suction, 1750-Lb. Discharge, 1,792,000 Cu. Ft. Per Day.
8. 5¾"x13"—117 H.P., 200-Lb. Suction, 700-Lb. Discharge, 1,600,000 Cu. Ft. Per Day.





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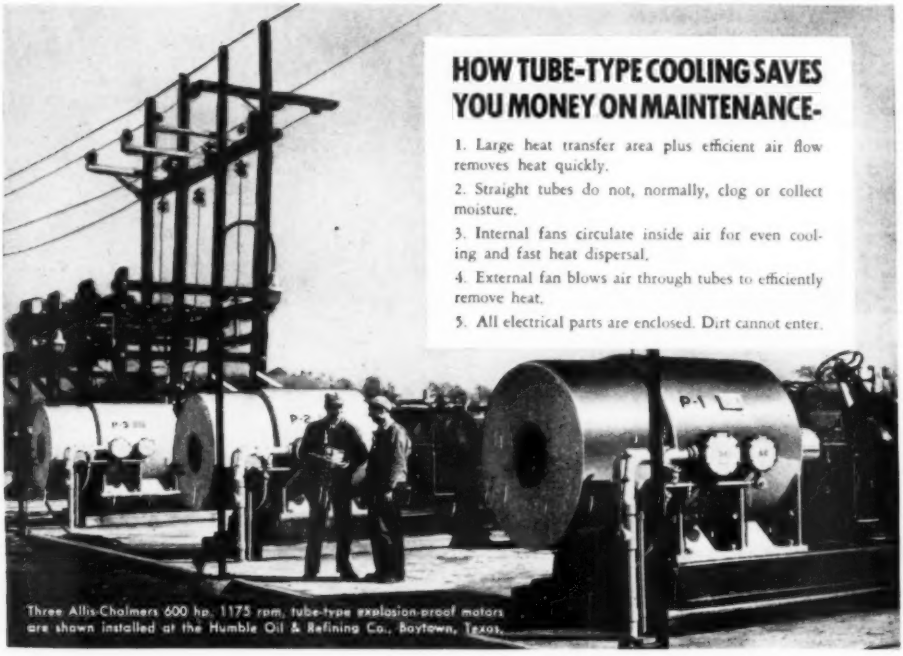
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P-1
P-2
P-3
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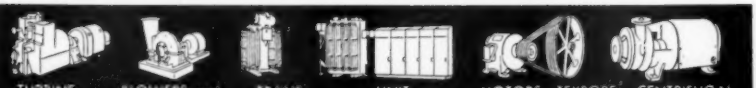


industrial fuel-gas system serving plants in the Corpus Christi area.

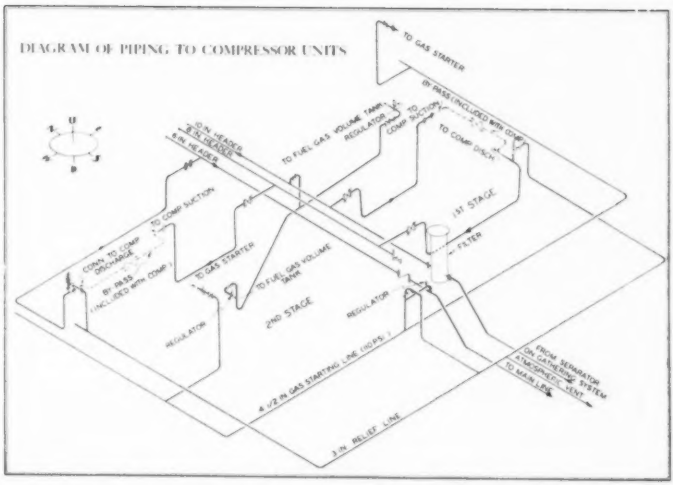
All compressors are V-belt driven by Waukesha multicylinder gas engines rated at 213 hp. at 1,300 r.p.m. For the continuous service required of a compressor plant of this nature, engine speed is reduced to 1,000 r.p.m. Operated at this speed and derated to approximate A.P.I. specifications, the engines have horsepower output of 117 each.

These engines are skid-mounted with Ingersoll-Rand single-stage, horizontal compressors. The first-stage units have a 9½ by 13-in. compressor cylinder while the high-stage units are equipped with 5½ by 13-in. cylinders. Each unit has a rated gas-handling capacity of 1,600,000 cu. ft. per day when operating at 275 r.p.m.

In addition to the low-pressure field gas being handled, excess 100-psi. gas which the pressure-maintenance plant cannot handle is brought to the No. 2 station. This volume currently amounts to about 8 per cent of the station's 6,000,000-cu.-ft.-daily throughput. The 100-psi. gas is brought to the station through a reducing valve and a lateral of the low-pressure gas-gathering system.

For gathering the low-pressure gas, about 4 miles of 2½ to 5-in. new lines were laid. These join into a 6-in. main line which is expanded to 10 in. at the station to serve as a low-pressure header. A conventional field separator removes any liquids entrained in the gas. Any dirt or scale which may be carried over from the separator is removed in a positive filter equipped with removable mohair elements.

The 200-psi. gas from the low-stage compressors discharges into an 8-in. header which also serves as a manifold for the high-stage units. The high-pressure gas is discharged into a 6-in. header. The accompanying diagram (and some of the photographs) illustrate the layout of the



Diagrammatic sketch of piping to compressor units Nos. 7 and 8. Piping to the other three low and high-stage units is, of course, identical

headers, compressor units, and other mechanical details of the station.

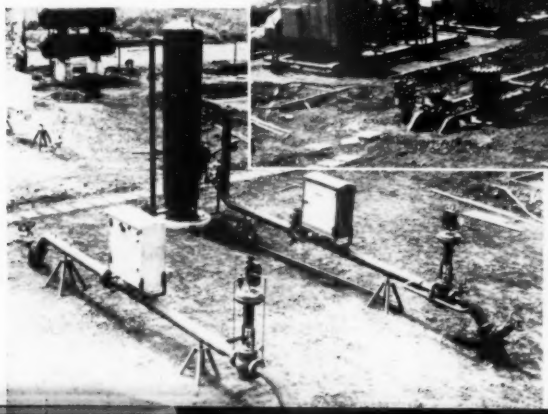
Finished, reinforced concrete slabs, 1 ft. thick, were poured as foundations for the compressor skids. In order that the bolts would not extend above the foundation and interfere with the units being easily skidded into place, nuts for the anchor bolts were placed beneath the top surface of the concrete. Also, prior to receiving the units, all gas suction and discharge lines, the fuel lines, and other piping were run to each compressor site. Thus when a unit was received, connection of these stubs to the unit and bolting of the six anchors was about all that had to be done.

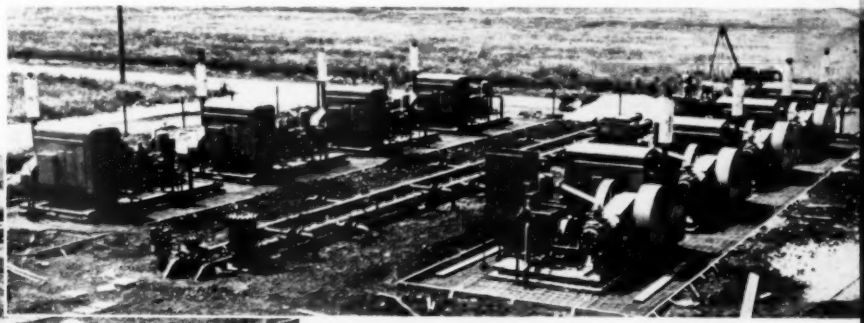
Gas from the low-pressure manifold is used as fuel for the engines, being distributed through a 1½-in. fuel line. To provide starting gas for turning over the compressors, a piston-type starting air motor was installed. This operates on 110-psi. gas, taken from Southern Minerals 700-psi. main line and reduced to the required pressure.

Cooling of the engine-jacket water is accomplished in a conventional engine-mounted radiator. For cooling the compressor cylinder water a second radiator is mounted on the skid, with the air-cooler (on the low-stage units) positioned between radiator and air blower. Power for the operation of the compressor water pump and blower is transmitted through a V-belt drive from a sheave mounted on the compressor flywheel.

When the units were first placed in operation there was a tendency for the cooling air to be recycled between the two radiators; the blower was

Below: Meter runs and separator on the field inlet line to the compressor plant





Above: General view of the new Southern Minerals Corp. portable compressor station in Richard King field. The bank of compressors at right are the first stage units and those on the left, the high-stage units. When the station is completed, sheds will cover both banks of compressor units

pushing air forward and the engine fan was pulling its air from that direction. To remedy this condition an air scoop was added to the blower so that air through the compressor radiator is diverted upward, above the level at which the engine radiator is drawing air.

So that makeup water would be readily available at each unit, a 2-in. gravity water system was laid. Risers (1-in.) and rubber hose permit the radiators to be refilled with minimum effort. The water system is connected to two 20-in. by 16.5-ft. vertical storage tanks. Sodium dichromate is used for treating the water so that one tank acts as a settling tank while the other is in service.

As mentioned earlier, ease of maintenance and the flexibility of operation offered were outstanding factors which caused the selection of this type compressor unit. Most lease men are familiar with high-speed, gas-gasoline motors and can perform routine maintenance with only little instruction. In fact, the units were designed with this thought in mind.

If one engine should break down, however, it can be easily replaced in short time with only little effect on the station's over-all operation. Because of their slow operating speed, long trouble-free service is expected of the compressors themselves.

Automatic shutdown devices, such as maximum temperature and high-level switches, permit the units to operate with minimum supervision. One operator looks after the station and performs maintenance work during his 8-hour daylight tour. At nights if any trouble occurs and an engine goes down, he is instantly alerted by an alarm installed in his home.

Relief valves are mounted on the discharge line of all compressors. These function to discharge the gas into a 3-in. relief line which leads to an atmospheric vent nearby. The compressors also are equipped with bypass lines so that the load can be removed from the compressors while they are being started.

All auxiliary equipment for the engine-generator sets, such as fuel-gas pressure regulators and volume tanks, is contained in each skid. Units, therefore, are self-sufficient and can be easily added or removed as the field gas requirements dictate. Currently only three of the four units in each stage are required to handle the gas load. Should oil allowables be increased, or should the gas load become greater for other reasons, extra compressor capacity is immediately available. If the gas load decreases, which is not anticipated for years to come, units can be removed easily for use elsewhere. Or, should it ever prove desirable to shut down the station and handle the gas in some other manner, practically all of the investment can be salvaged and the compressors moved to other fields for gas-lift or other service.

As shown in the accompanying photographs, shelters had not been installed over the two banks of compressors. These sheds, 16.5 by 90 ft. and 8 ft. high, have since been erected. The bottom 6.5 ft. of the shelters are open to permit adequate ventilation and easy access.

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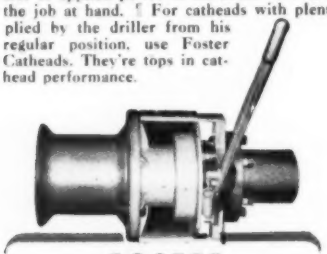
Powerful, heat-resistant friction clutches, engaged by a crowder mechanism of advanced design, assure plenty of power for all catheading operations. Driller is in complete control of applied power at all times . . . he gets exactly the amount of pull required for the job at hand. ¶ For catheads with plenty of power . . . CONTROLLED power applied by the driller from his regular position, use Foster Catheads. They're tops in cathead performance.



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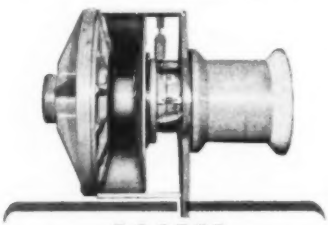

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Safer . . . slower line speeds prevent jerking of tongs. *Faster* . . . powerful friction clutch engages or disengages either instantly or gradually at the will of the operator without slowing cathead shaft. *Dependable* . . . heavy bearings, ample lubrication, powerful single plate friction clutch, heat-resistant clutch facings, high quality materials combine to make a durable cathead. *Economical* . . . designed for direct shaft mounting to reduce bending of cathead shaft; stationary sleeve mounting for drum (patented) common to both catheads, eliminates complicated brake.

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BOOKS

STEEL CASTING INDUSTRY. Published by Steel Founders' Society of America, Midland Building, Cleveland. 34 pp.

This booklet lists seven prime reasons, aside from economy, why manufacturing industries are making increased use of steel castings for a great variety of finished products. Emphasis is directed to the steel-casting industry's research activities, and data for cost reduction, for a wide range of engineering and mechanical applications.

INDUSTRIAL USES OF RADIOACTIVE MATERIALS. A SELECTED BIBLIOGRAPHY. Published by Arthur D. Little, Inc., Cambridge, Mass.

This pamphlet is simply a bibliography of references dealing with petroleum, mining and metallurgy, textiles, instruments, radiography, analysis, and other specific fields, as well as general background references, and survey articles of industrial applications.

PRESSURE DRILLING IN IRAN

Two methods employed to balance and control formation pressure—closed method and open method

by H. W. Lane, O.B.E.

This is the second of three parts of an article entitled "Modern Drilling and Production Practices in the Oil Fields of South Iran," which was presented at the Fourth Empire Mining and Metallurgical Congress at London. In this installment the author, who is with Anglo-Iranian Oil Co., Ltd., describes details of pressure-drilling methods employed, and why it is necessary to maintain stable pressure conditions in drilling the difficult series of formations encountered. The first installment, which appeared last week, described general drilling techniques, and mud and casing programs. The final installment, to be published next week, will deal with production practices.

3. PRESSURE DRILLING

THE term "pressure drilling" means the imposition of a mechanical back pressure on the well during drilling so that the formation pressure can be balanced and controlled by a mud column of a lighter gravity than would otherwise be necessary. There are two methods (Fig. 5):

The closed method, whereby the mud flush returns from the well are taken through a closed vessel in which mud screens or settling devices are installed and which work under full control pressure. In this method the pressure of the mud never falls below the control pressure and slush pump capacity is therefore reduced.

The open method, whereby the mud flush returns from the well are discharged through beans which maintain the pressure on the well by restricting flow.

Full-pressure drilling is essential in some wells, but, in general, in order to obviate the necessity of snubbing pipe into and out of the hole, a system of semipressure drilling has been adopted. The well head for drilling under pressure consists of a Cameron gate, a Seamark hydraulic packer capable of shutting off on any part of the drill string and permitting vertical movement, and a double-deck stuffing box which provides the shutoff while drilling.

Side line connections are taken from above and below the Cameron gate and these are connected to twin cutting separators and adjustable beans, which discharge on to a vibrating screen over the mud-return flume. Separators and beans are mounted on a unit on a skid base. A third adjustable bean controls a line for direct return from the hole to mud reserve or gas-cut mud tanks.

Returns Taken from Above

Normally returns are taken from above; the Cameron gate and the connections below it are for emergency control when the gate has been closed around the drill pipe.

A composite 4½-in. A.P.I. full-hole and flush-joint drilling string is used; as drilling proceeds the flush-joint pipe is added at surface to work through the double-deck packer in conjunction with a round kelly and overdrive. Three nonreturn valves are employed in the drilling string, and one on the mud-delivery line to the well head which automatically checks pressure release in the event of any failure on the pump-discharge side when this line is in use. An automatic spider or grip is fitted which prevents drill pipe being blown out of the hole in the event of failure near the surface.

Each adjustable bean is master-controlled by a cock, which can be shut by the bean operator when circulation is stopped, or in an emergency. A back-pressure recording gage is mounted at the driller's control panel and a duplicate reading is continuously shown on the well-pressure line to the hydraulic accumulator of the Seamark packer.

The saying that "prevention is better than cure" has never proved truer than when applied to drilling these formations and so, in practice, pressure drilling is begun before there is any actual evidence for its necessity in each hole. Sooner or later in every case it has proved essential and it has been observed that if one caving, or squeeze, or gas, or water entry takes place at any point in the formation in sufficient degree to cause pressure disturbance, then the whole open hole may be affected adversely and as much as 2,000 ft. of previously faultless hole may cause continual trouble until cased off.

In the system employed an appropriate back pressure to boost the head of the drilling mud is maintained on the formation continuously so long as the bit is working in the open hole. When it becomes necessary to pull out, a heavier mud is circulated into the casing after the bit has been pulled up inside the casing shoe; when the casing filled to surface with this heavy mud the drill pipe is pulled out.

The specific gravity of the pulling-out mud is calculated to equal the combined head of the lighter drilling mud remaining in the hole from the casing shoe to bottom plus the back pressure, which is released gradually and proportionately during the mud exchange. Similarly when running in, with the bit at the casing shoe the well head is closed and the reverse mud exchange takes place. On the way in the drill pipe is filled with drilling gravity mud from a hose in order to prevent air cutting when circulation is commenced, and as the heavy mud is circulated out of the annulus the appropriate back pressure is gradually built up. When the exchange is complete, and the column stable, the bit is run to bottom and drilling proceeds. A graph or chart is provided for each well to show at a glance the correct adjustment to back pressure to compensate for a change in gravity.

The success or failure of pressure drilling the difficult series of formations depends mainly on the maintenance of stable pressure conditions on these formations. To achieve such conditions good equipment and a first class active-minded crew are essentials. Once the best combination of mud gravity and back pressure for a given range of hole is determined the closest attention must be given to avoiding variation, for it has been found that the least carelessness may allow caving or "squeeze" to take place, and/or water to enter the hole, resulting in many days being spent in reaming to condition the hole, or freeing stuck pipe as a direct result.

Benefits of Heavy Mud

It has been found that if the bit, which may not be entirely clean, is pulled up too quickly a reduction of pressure below, or momentary increase above it, may cause trouble. Similarly, a bit run down the open hole too fast may cause a brief pressure increase ahead, inviting trouble by disturbing loosely packed formation in the wall of the hole.

It will be clear that the factor most likely to cause fluctuating pressure conditions is the back pressure; the sudden failure of a pump or line, or carelessness on the part of a bean operator are two possible causes. Therefore, it is considered that the use of the heaviest reasonable mud with lowest back pressure is the soundest practice. Although a heavy mud may be more expensive to use, and may even cause shut-down time on account of reconditioning, it does

provide better stability, as well as a greater flexibility factor against a sudden demand for increased presure, and the lower back pressure required effects a big savings in wear and tear of all surface equipment. It is clear that in drilling with a gravity of 1.3 mud and 1,200 psi. back pressure the hazard of pressure variations on bottom is far higher than when using a gravity of 1.75 mud and 400 psi. back pressure.

Process Is Routine

In practice this system of semi-pressure drilling is far less complicated than it may appear to be on paper and, given a crew of men who thoroughly understand the principle of, and reason for, the process, it quickly resolves itself into a routine with few operational difficulties. One great virtue of pressure-drilling methods over straight mud control is that the superimposed pressure may be varied very quickly and easily to suit any new conditions that may be encountered as drilling proceeds, requiring a change in the pressure imposed on the bottom of the hole.

In conclusion it may be said that though semipressure drilling means poorer footage, some loss of drilling time, and apparently slow progress, the inevitable troubles which accompany any attempt to penetrate these formations with open circulation make the simpler practice the less attractive of the two propositions.

4. DRILLING IN

The operation of drilling through the main reservoir rock for production is one requiring the utmost care and it is usual to employ only very experienced drillers on this work. The careful balance which must be kept requires constant watch on the mud and when mud losses start to occur instant action is required.

The well head used for drilling in is designed to carry out a multiplicity of operations. It includes a Seamark blowout preventer, connected up so that the pressure of the well itself is applied in closing it. If pressure in the well rises it is automatically applied to the blowout-preventer rubber around the drill pipe and is amplified to a pressure higher than that of the well by the action of a weighted plunger. Below this is fitted a second blowout preventer of the Cameron type, which may be closed from a remote control by steam or hydraulic pressure or by hand. These devices are of specially robust design, capable of withstanding pressures from 6,000 to 10,000 psi.

When drilling a well in for production the aim is to tap the productive horizon without sealing off production by mudding off. The reservoir rock is, as stated earlier, a thick bed of limestone, some sections being tightly compacted, some highly porous, but interconnected with an

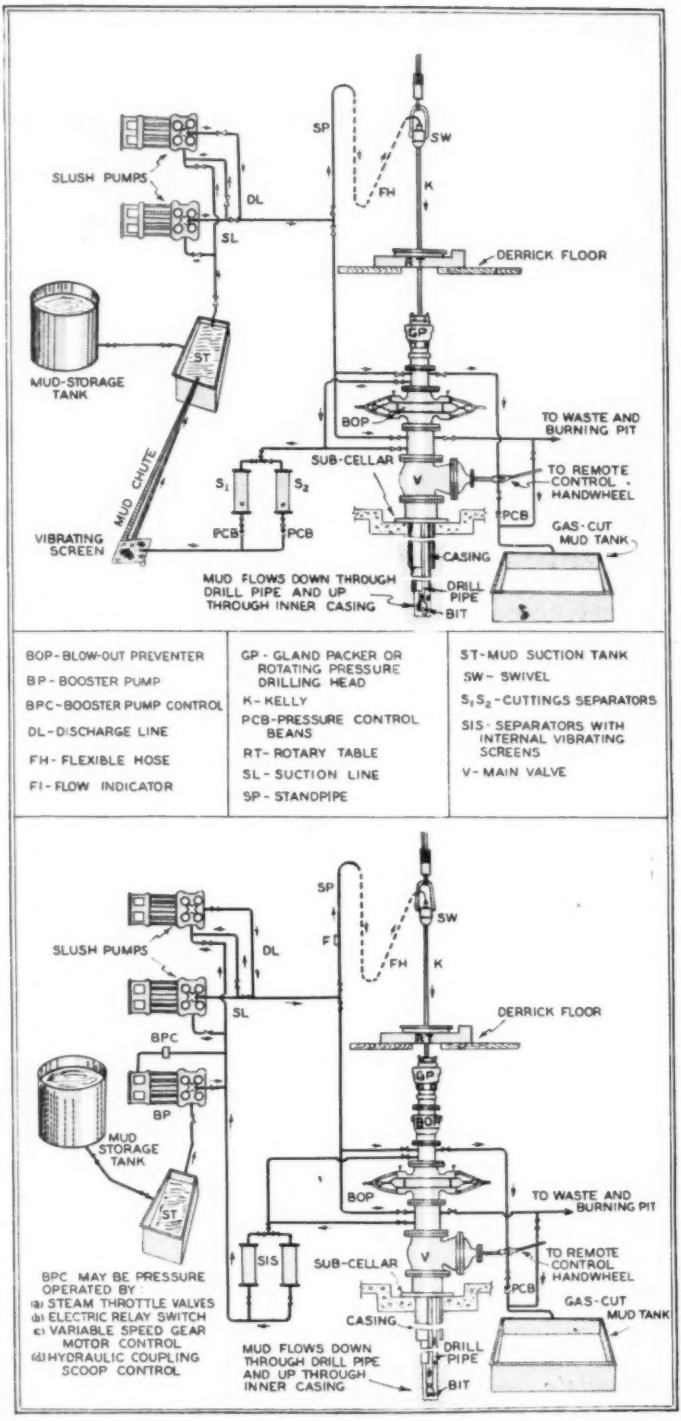


Fig. 5—Pressure-drilling system

extensive fissure system. The pressure in the reservoir is usually known and mud of the required gravity to give a differential of about 250 psi. prepared.

Mud must be of low permeability so that mud ringing in the porous zones is minimized. When open formation is struck, as in the case of striking a fissure, mud losses immediately occur. These losses may be so high that circulation is entirely lost. If losses were to continue until all stocks of mud had been used up there would be danger of the well coming in and developing a high well-head pressure. It is therefore necessary to hold a reserve of special viscous mud in storage ready for use. This mud may be mixed with cellophane, mica, or other flaked material.

Sealing Producing Formations

The sealing of producing formations in wells is a problem which has confronted oil men in all parts of the world and an extraordinary variety of materials have been used for this purpose. Any material of a fibrous nature mixed with the mud, provided it is pumpable, is effective, but many drillers favor wheat, barley, beans, or chopped straw, on the grounds that they swell after absorbing water. In the famous Leduc well in Canada, which recently flowed out of control for many weeks, mud mixed with chicken feathers was used and proved singularly effective in shutting off production. In the selection of material for this purpose it must always be recognized that the production which is being sealed off for safety reasons has to be brought back when suitable arrangements have been made for pulling the tools from the hole. It is possible to seal off formation so well that production is lost and may never be completely regained.

The use of flaky material for this purpose proves most effective in that it covers the porous formation without necessarily entering into the fissures or fine cracks and jamming and sealing them off permanently. As soon as pressure is lowered in the hole itself these flakes are loosened from the walls of the hole by the pressure of oil and gas in the formation, leaving a clear channel for production. In low-pressure wells sealing off of production is naturally more liable to happen and it is common for an oil-base mud to be employed which will impose the minimum of differential pressures. Mixtures of fuel oil and water are used in very low-pressure fields.

5. DRILLING THROUGH THE GAS DOME

It is necessary from time to time to drill wells through the gas dome for the purpose of producing from an exploratory well which has entered the reservoir rock above gas-oil level. This operation is one of great hazard, requiring special care. The weight of the mud column must, of course, be equivalent to the pressure in the gas dome **plus** a safe differential As the hole grows deeper this differential increases and it is possible under certain conditions to be carrying a 1,000-lb. differential on the formation at the bottom of the hole which has started at the top of the dome with only say 250-lb. differential. If the well strikes a fissure under these conditions the mud loss may be such that stocks are exhausted and the well is liable to come in with the drill pipe in the hole before the producing formation can be mudded off.

Although every possible safety device may be fitted and be in good condition there is still a grave danger that the well may get out of control, since a small leak of dry gas at high pressure has a highly abrasive effect and a large leak may speedily develop. With a mud-and-gas mixture the effect is even more rapid. The solution is again the employment of pressure drilling since it enables a lighter mud to be used and the differential does not increase at the same rate with depth, a much more delicate control is also possible, since the striking of a fissure or open formation of any kind will be immediately registered at surface by a drop in control pressure at the well head, and suitable measures can be taken. Also since drilling is being carried out under a back pressure the fittings on the well head by which this pressure is controlled are in operation all the time, and the closing in of the well involving two or three operations by the driller if the well is drilling with open circulation are not necessary.

Two Main Valves Fitted

In this operation also highly viscous mud mixtures and sealing compounds must be held in readiness for the shutting off of open formation. Two main valves are fitted which remain on the well after completion. The top valve is the working valve used for closing in the well when the tools are out of the hole, but the lower valve or master gate is never closed until the well is completed. This valve is filled with grease at the commencement of operations and is the last line of defense. It is kept in reserve in case the upper valve fails or becomes damaged by the continual passage of tools in and out of the hole. Where possible the master gate is installed in a subcellar which can be flooded, thus affording protection in case of fire.

6. SAFETY

Correct safety practice is an important section of drilling and production technique in any oil field but in these oil fields there are certain conditions which make it of even greater importance. Pressures are high, the wells are among the biggest producers in the world, and the reservoir connection is so free that a blowout on one well might conceivably drain the whole field. Therefore the watchword has always been safety, not only in drilling practice, but in the equipment used, and in the manner of installing it.

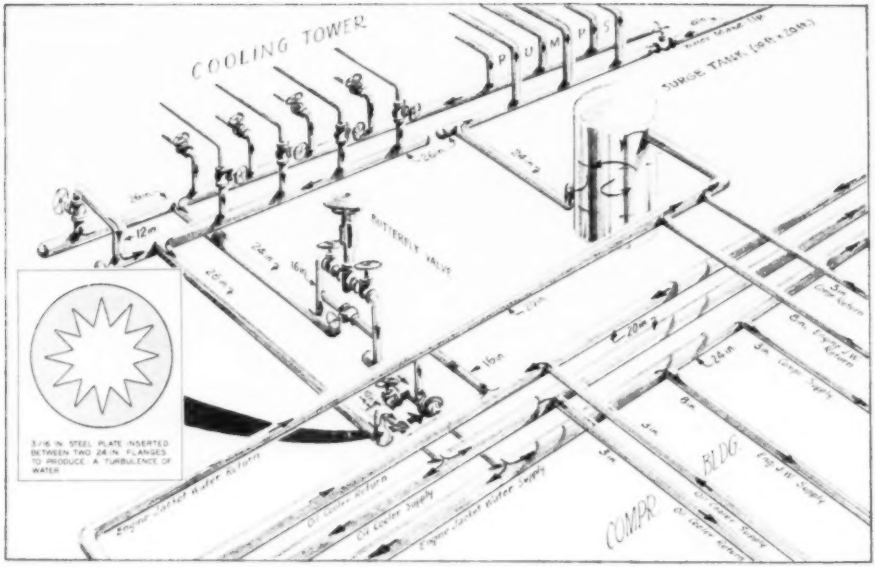
First, it is necessary to insure that the driller himself is familiar with emergency procedure in any situation, and is also familiar with the equipment which he has to handle. He is therefore issued a complete schedule of drilling instructions, which set forth quite clearly his responsibilities. In addition he has a complete set of drawings of every item of equipment he is using and a set of safety regulations.

It might be thought that this formidable array of literature would deprive him of all initiative or sense of responsibility, but the purpose is more to furnish him with a text book to which he can refer if he is in doubt as to a decision, a dimension, or a dilemma. Neither does it daunt him. It has been abundantly proved in practice that, in the absence of higher authority, drillers will act in an emergency where they might have failed through lack of knowledge of the correct action or, worse still, might have applied the wrong treatment with serious results.

Installing Drilling Outfit

The policy of safety is nowhere so important as in the installation of the drilling outfit. In locating a well the site is carefully chosen so that a special layout can be made. This layout is designed to facilitate in every way operations which might become necessary should the well get out of control. Accessibility, drainage, wind direction, the siting of pumphouses, remote controls, floodlights, and escape boxes all have to be considered and, when a location is made, it is usualy to allow a liberal tolerance so that all these conditions may be satisfied.

In the erection of the plant every possible safeguard for the crew is included both in guarding against accident while working and in assisting escape in the event of a blowout. Routine tests of the equipment are made daily, weekly, or monthly according to the degree of importance. Indicators showing the position of each valve are installed, those applying to the valves and blowout preventers on the well itself being designed so that they can be seen from the derrick floor and including an indicator showing the number of turns required to shut or open. Finally a log in detail is made of every item on the well head so that, when unapproachable through fire or blowout, the repair crew may know exactly what fittings have to be allowed for in their operation.

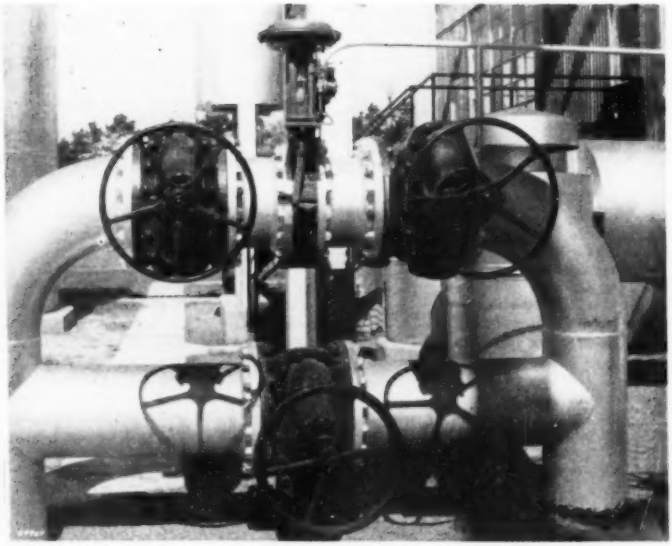


Single cooling system for engine oil, jacket water, and gas

Combination Cooling-Water System

Tennessee Gas Transmission Co. Installation Has Proved Effective During 18 Months of Operation

by W. A. Wiss*



Butterfly valve with diaphragm motor for controlling flow of 150° F. water from cooling tower to mix with 125° F. water from the oil cooler. This raises temperature to the desired jacket water supply temperature of 140° F.

TENNESSEE GAS TRANSMISSION CO. has put into operation during the past 18 months a cooling-water system combining the cooling water necessary to cool the engine oil, engine jackets, and compressor jackets into a single unit.

The distinctive advantage of having this system in place of a separate system for each operation is the elimination of one surge tank and additional circulating water pumps. A saving in building space and piping can be realized in most installations.

Arrangement and operation of this system is shown by the accompanying isometric drawing.

Begin the cycle of operation at the surge tank. Water enters the surge tank after leaving the engine jackets through the engine-jacket water return header. The water is heated from 140° to 150° F. in the engine jackets. Upon leaving the surge tank the water passes through the 24-in. header to the 26-in. header and to the 12-in. suction risers of the circulating pumps. From the circulating pumps the water is discharged into the 8-in. discharge risers through the 26-in. header flowing toward the cool-

*Plant results engineer, Tennessee Gas Transmission Co., West Monroe, La.

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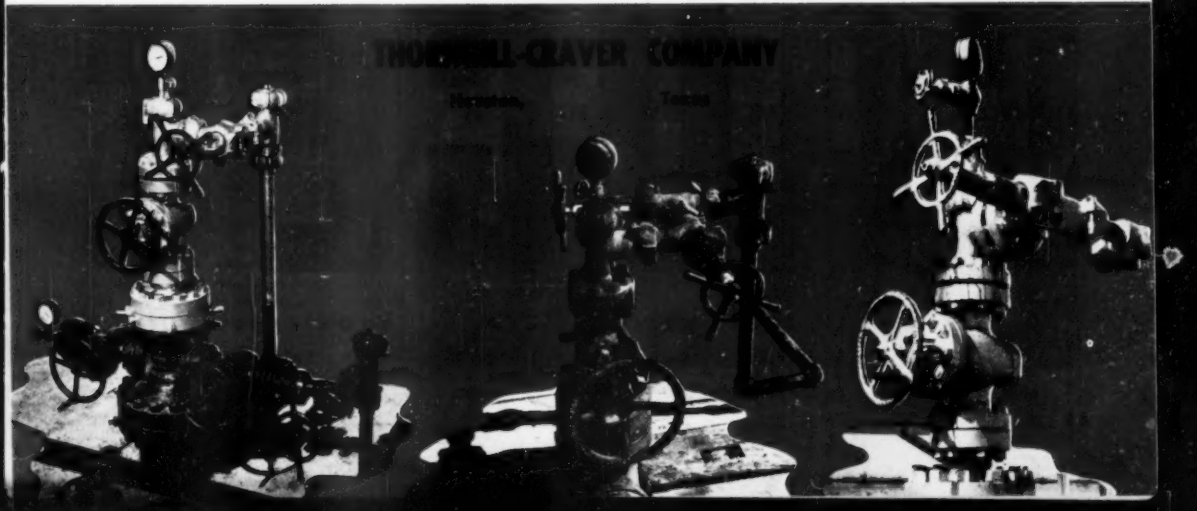

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ing tower. At this point the water divides into three parts: (1) part flows through the cooling coils; (2) part flows directly to the butterfly valve on the 16-in. jump over, and (3) the remainder flows through 12-in. manually operated bypass.

Quantity of water flowing through the cooling coils is governed by the degree of regulation of water passing through the 12-in. bypass, the amount passing through the butterfly valve on the 16-in. jump over, and the capacity of the circulating pumps.

During normal operation for example, the water enters the cooling coils at 150° F. and is cooled to 96° F. The 12-in. bypass is operated so as to raise water temperature to 106° F. before flowing through the 26-in. line to the oil-cooler supply header.

The 106° F. water from the oil-cooler supply header flows to each oil cooler where it comes in contact with the 144° F. oil from the engine crankcase. The oil temperature is lowered to 125° F. before the oil returns to the engine crankcase. During this operation the water flowing through the oil coolers has been heated from 106° to 125° F.

This 125° F. water passes through the oil-cooler return header and out to the mixing chamber by way of a 16-in. line. At this point mixing chamber produces a turbulent flow of 150° F. water from the 16-in. jump-over line and of the 125° F. water from the oil-cooler return header. The turbulent flow of water in the 24-in. mixing chamber is produced by an irregular cut 3/16-in. steel plate held between two 24-in. flanges. A detail of this plate is shown on the drawing.

Jacket Water Temperature Control

The quantity of 150° F. water from the 16-jump over needed to mix with the 125° F. water from the oil-cooler return to raise its temperature to the desired jacket-water-supply temperature of 140° F. is controlled by the position of the butterfly valve. The butterfly valve is located between the two 16-in. valves on the 16-in. jump over. The butterfly-valve position is controlled by a diaphragm motor and held in position by a valve positioner. This is in turn controlled by an automatic temperature controller.

The automatic temperature controller is mounted at a convenient place for operation in the compressor building. This controller has its thermo-bulb located where the 24-in. header from the mixing chamber enters the 24-in. jacket-water-supply header.

Control point of the automatic temperature controller is adjusted for 140° F. which is the desired temperature needed at the engine-jacket-water-supply header. The automatic temperature controller maintains a pressure of 15 psi. on the top of the diaphragm motor at all times. With the controller set in the direct position, an increase

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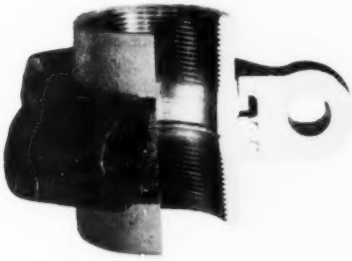

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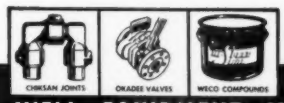

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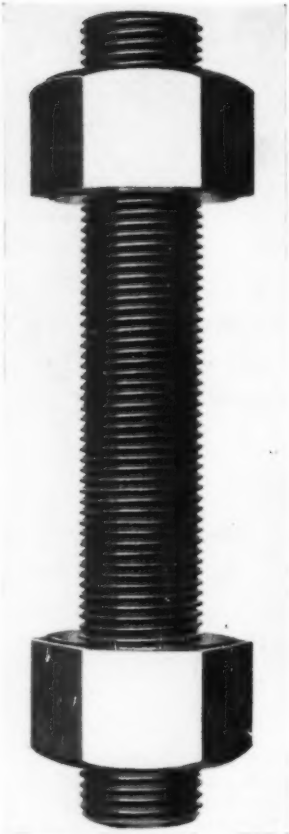

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in temperature will cause the controlled air pressure on the bottom of the diaphragm to increase, tending to close the butterfly valve, thus reducing the quantity of 150° F. water to the mixing chamber. This will allow more 125° F. water to the mixing chamber, resulting in a drop in temperature at the point of water supply to the engine-jacket water-supply header.

Insufficient Heating

Supply header for the compressor jackets is piped from the engine-jacket water-supply header. The discharge header for the compressor jackets is piped to the engine-jacket water-return header. In most cases the gas compressed is not heated sufficiently by compression to raise the temperature of the water discharged from the compressors to the engine-jacket water-return temperature. In this case it is necessary to throttle the flow of water to the compressor jackets by closing in on the water-header valves to the compressors.

The 10-in. bypass shown on the drawing can be used to lower the temperature of the water supplied to the mixing chamber. During normal operation it remains in the closed position.

The 16-in. bypass on the 16-in. jump over is opened only in case the automatic temperature controller fails to operate.

One circulating pump operating at full capacity is sufficient to maintain a proper velocity of water to keep the temperature within the desired limits when the five 1,000-hp. engines are in operation. When fewer than five engines are in operation it is necessary to reduce the velocity of water through the system by closing off on the pump discharge valve to maintain the proper temperatures throughout the system.

Offshore Pipe Line

(Continued from page 73)

First method used was to weld the line, a joint at a time, using the substructure of the production platform for working space. Then a cable was passed to the producing well platform and the line dragged along the bottom with a two-buoy float to keep the front end afloat for tying into the platform.

To provide more working space, the next method utilized the drilling barge (converted L.S.T.) at the producing location for working space. In this case, a towing cable was passed to the production platform and back to the drilling barge. With the increased working space, two joints could be welded at a time. This minimized the angle at which the 2-in. line entered the 30-ft. water, thus reducing the stress on the line.

For a third experimental procedure, the entire length of line was first welded ashore. It was then equipped with floats at each end and towed onto location.

Final method utilized was similar to the third. The difference was that barrel floats were tied at short intervals to keep the entire line afloat while it was being towed onto location. When the location was reached, the two ends were secured and the barrels then cut loose thus dropping it to bottom.

Based upon the experience using these four methods, the concensus seems to be that the last-described method is the most satisfactory, if weather conditions permit the line to be towed without undue difficulty.

With regard to the production platform, it was laid out with the idea in mind of using it for the entire field. If future production justifies, additional piling sections can be added to the platform to enlarge it.

Platform Details

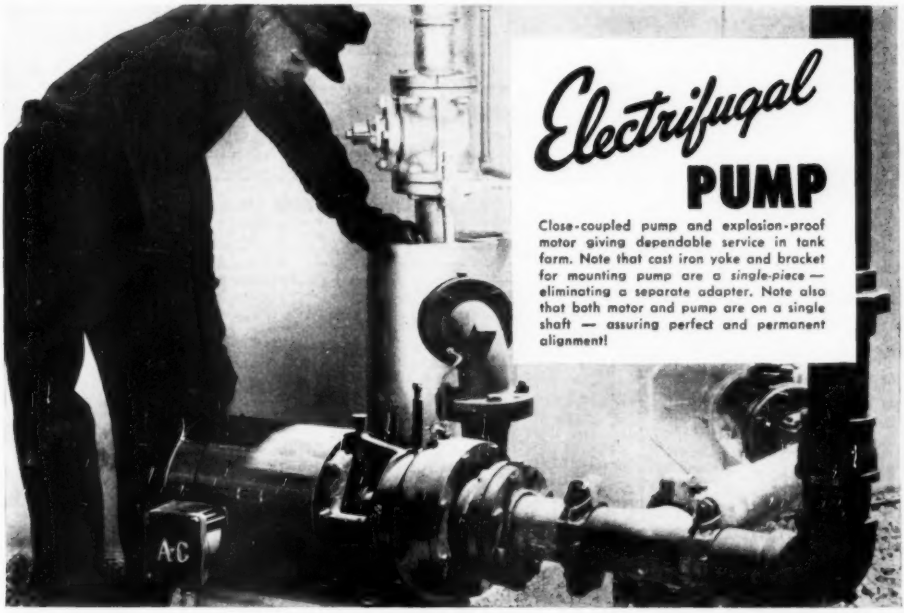
The platform is 48 by 24 ft. and was designed for the drilling of two wells. Extra space has been obtained by building a platform on top of the triangular dolphin bumper which was installed originally as a buffer between the platform and the L.S.T. drilling barge. On this bumper platform, The California Co. has installed the main pipe-line pump and a standby. Enough space remains to install a second large pump should this become necessary.

The gager on the production platform is provided with a portable radio permitting communication with the producing wells and also shore headquarters, if necessary. One gager is on the platform at all times and the offshore work shift is 12 hours. The men are "at sea" for 7 days and then off 7 days. Presently, they are sleeping on the nearby L.S.T. drilling barge.

With the facilities now installed, The California Co. can handle a daily production of 7,000 bbl. (Actual production is currently 1,400 bbl.) Flowing pressure on the wells now producing ranges from 250 to 1,100 psi. This is sufficient pressure to flow the wells directly to shore without a pipe-line pump. However, because of potential sand troubles, production of paraffin, and possible future water production with the resultant pressure drop, the idea of flowing direct to shore was abandoned.

A number of other transportation and production methods were considered by company engineers before the pipe line was laid and the production platform equipped. However, it was decided that the setup described in this article would be the most economical for this particular situation. Company engineers emphasize that each new field in the Gulf of Mexico will present its own peculiar problems and a pipe line to shore will not always be the most economical method of handling the production.

How Unit Construction Cuts Petroleum Pumping Costs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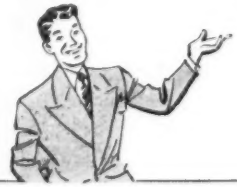

TYPICAL ANALYSES (In Per Cents)

Type No.	Chromium	Nickel	Carbon	Other Elements
301	16-18	6- 8	Over .08-.20	
302	17-19	8-10	Over .08-.20	
302B	17-19	8-10	Over .08-.20	Si 2-3
304	18-20	8-11	.08 max.	
308	19-21	10-12	.08 max.	
309	22-24	12-15	.20 max.	
309S	22-26	12-15	.08 max.	
309Cb	22-24	12-15	.10 max.	Cb 8xC min.
310	24-26	19-22	.25 max.	
314	23-26	19-22	.25 max.	Si 1.5-3
316	16-18	11-14	.08 max.	Mo 2-3
316Cb	16-18	10-14	.08 max.	Mo 2-3; Cb 8xC min.
317	18-20	11-14	.08 max.	Mo 3-4
321	17-20	9-13	.08 max.	Ti 5xC min.
329	23-28	2.5-5	.20 max.	Mo 1-2
330	14-16	33-36	.15 max.	
347	17-20	9-13	.08 max.	Cb 10 x C min.
403	11.5-13		.15 max.	
405	11.5-13.5		.08 max.	Al .10-.30
410	11.5-13.5		.15 max.	
416	12-14		.15 max.	P, S, Se min. .07 Zr, Mo max. .60
430	14-18		.12 max.	
443	18-23		.20 max.	Cu .90-1.25
446	23-30		.20 max.	N_2.10-.25
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CORROSION PROTECTION

of Oil-Refining Equipment

by Henry P. Zeh*

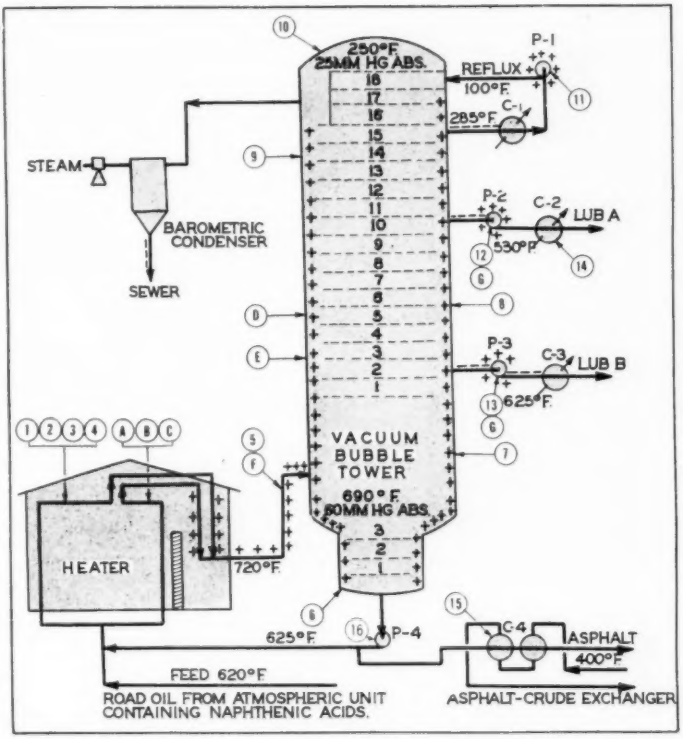
IN recent years many large-size oil refining units costing from 1 million to as much as 10 million dollars have been constructed. The maintenance costs for these units have often been very high and usually much of the cost has been the result of inadequate provision for corrosion. Many refining units have also been forced to shut down after short service because of corrosion of minor parts, such as small connections to vessels or because of the rapid corrosion of shell-and-tube heat-exchanger equipment. Forced shutdowns cause the unit to be taken out of service for a minimum of about 24 hours. It is difficult if not impossible to evaluate the product loss resulting from shutdowns as it varies with the product being produced, the size of the unit, and the seasonal demand for the product. It has, however, been variously estimated at $500 to $1,000 per hour for a large unit.

It is obvious from the loss in product alone which can result from a forced shutdown, that it is desirable to make a thorough study of the probable corrosion of a refining unit prior to the start of construction for the purpose of selecting adequate materials and corrosion allowances for all parts of the unit. It is equally desirable to scrutinize closely all failures that occur during operation in order to ascertain whether corrosion was a factor.

Record of Corrosion Experience

The first and most important information required by the corrosion engineer is a condensed record of past corrosion experience in all the refining units in his company These records should contain authentic data on actual life of equipment, on accurate metal-loss measurements of the equipment, or of corrosion rates obtained by exposing metal and alloy specimens in the units. It is important also,

*Standard Oil Co. of California, Richmond, Calif. Paper presented before recent Western Metals Congress and Exposition, Los Angeles.



CORROSION DATA FOR 1939 TO 1946

No.	Description	Rate*
1.	Heater tubes, wall coil	.002
2.	Heater tubes, roof coil	.004
3.	Heater tubes, convection	.009 to .032
4.	Heater headers	same as tubes
5.	Top transfer line	01 to .02
6.	Column shell, bottom	.002
7.	Column shell, flash zone	.006
8.	Column shell, at 4th tray	.002
9.	Column shell, at 14th tray	.003
10.	Column shell, at top	.0005
11.	Pump, P-1 impeller, hrs.	5,000
12.	Pump, P-2 impeller case, hrs.	24,000
13.	Pump, P-3 impeller, hrs.	5,000
14.	Cooler, C-2 admiralty tubes hrs.	26,000
15.	Exchanger, C-4 tubes, hrs.	30,000
16.	Pump, P-4 impeller, hrs.	35,000

Notes

A. Carbon steel tubes failed by localized corrosion in rolled in sections.

B. Headers are lined with 25-20 Cr-Ni.

C. Convection bank tubes are 18-8 Cr-Ni.

D. Cast iron trays, bubble caps and hold down bars, 18-8-3 Cr-Ni-Mo bolts and wiers. Life of steel tray bolts and hold down bars was 16,000 hours.

E. Shell lined with 18-8-3 in 1942.

F. Top transfer line replaced with 18-8 Cr-Ni in 1942.

G. Pumps P-1, P-2, and P-3 replaced with 18-8-3 Cr-Ni-Mo in 1942.

*Corrosion rates and life in hours are for carbon steel or cast iron unless otherwise stated. All rates are shown as inches penetration per 1,000 hours and the word "nil" indicates a rate less than 0.00005 in. per 1,000 hours.

CORROSION RATES OF SPECIMENS EXPOSED THROUGHOUT COLUMN FROM SEPTEMBER 1944 TO MAY 1945

	H	J	K	L	M
	Tray name or number				
Material	No. 2	No. 4	No. 8	No. 16	Top tray
Carbon steel	.002	.002	.003	.002	.0003
Cast iron	.0006	.0006	.0003	.0002	.0001
5 per cent chrome steel	.002	.002	.002	.004	.0002
18-8 Cr-Ni	.0001	.004	.003	pitted	nil
16-13-3 Cr-Ni-Mo	nil	nil	nil	nil	nil

Fig. 1—Drawing of crude-oil vacuum distillation unit, showing operating conditions and location of equipment parts periodically checked for corrosion rate (unit was constructed in 1935). Tabulated data under drawing present details of the corrosion studies

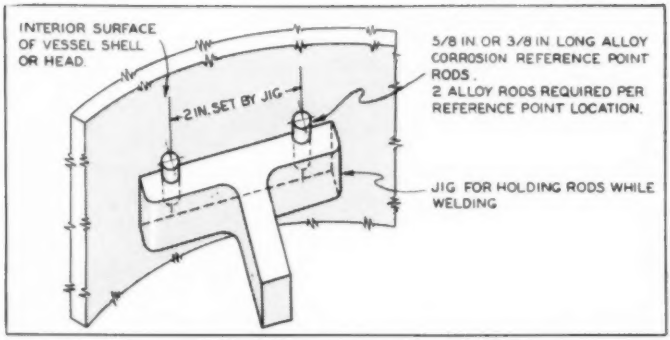

INTERIOR SURFACE OF VESSEL SHELL OR HEAD
2 IN. SET BY JIG
5/8 IN OR 3/8 IN LONG ALLOY CORROSION REFERENCE POINT RODS. 2 ALLOY RODS REQUIRED PER REFERENCE POINT LOCATION.
JIG FOR HOLDING RODS WHILE WELDING

Fig. 2—Corrosion reference point, with jig for holding the noncorroding rods in a parallel position while welding one end of each to the vessel shell or head

where different types of stock are processed in the units, that, if possible, separate records be maintained for each kind of stock.

One type of condensed record form containing corrosion data on a crude distillation unit is shown in Fig. 1. This form consists of a flow diagram of the unit, showing stock processed, operating temperatures and pressures along with notes on past corrosion experience, i.e., life of parts or corrosion rates; it also indicates where corrosion-resistant alloys were originally or subsequently installed. While not shown on the form, colors can be used to advantage for outlining parts of equipment where corrosion-resistant alloys have been installed or where corrosion is fairly rapid and additional protection will be necessary in the future. Records of this type should contain as nearly as possible all of the reliable corrosion data on the unit. Only part of the unit and a few of the corrosion rates and notes are shown in Fig. 1. The actual record from which Fig. 1 was copied contained data on over 100 parts of the equipment.

Such records are of assistance in selecting replacement materials during maintenance shutdowns, when there may be little time for a thorough review of the original records. They are also very useful when selecting materials and corrosion allowances for new units of similar type. A complete record of past experience frequently also serves to point out where data are lacking that could be useful.

The cost of reviewing past records and assembling the data in a condensed form is ordinarily not high; the time required is in the order of 50 to 100 man-hours per unit. The economy of keeping up the records may be questioned as records are a continuing expense. It has been found, however, that the records need only be brought up to date every 2 or 3 years since the personnel using them are ordinarily familiar with recent experience.

Corrosion Reference Points and Plant Corrosion Tests

The usual means of determining corrosion rates in units is by thickness and diameter measurement of equipment parts. To assure the obtaining of adequate corrosion data, it is also advisable to use "corrosion reference points" consisting of a noncorroding alloy installed in vessels and large lines as permanent surfaces from which to measure the metal loss by corrosion with the aid of a depth micrometer. This method of measurement makes it possible to obtain accurate corrosion rates.

One type of corrosion reference point which has been found very satisfactory and which is also inexpensive and easy to install is shown in Fig. 2. It consists of two short length of 5/16 or $\frac{3}{8}$-in. round rod of type 316 stainless steel which are laid on the vessel surface 2 in. apart and parallel to each other. They are then welded to the surface at their ends with type 316 electrodes.

A jig for holding the rods in a parallel position is also shown in Fig. 2. After one end is securely welded, the jig is slipped off the rods which are then lightly hammered to assure that they lie snug against the vessel. The other ends are then welded. The rods should be protected from weld spatter while they are being attached. Type 316 stainless steel was chosen for the reference points as it has good resistance in nearly all oil-refining processes. For acid services, Hastelloy B or C or other corrosion-resistant alloys may be required. To assure that a complete corrosion history will be available, reference points should be installed during plant construction.

In addition to having corrosion rates on the construction materials used it is also desirable to expose specimens of corrosion-resistant alloys in the unit at the start of operation because: (1) some of the materials used in the construction may prove to be inadequate as a result of error in the original selection of materials, or (2) processing more stock than the unit was designed for can increase velocities to the point where corrosion of the originally selected materials may become severe.

Also, if a more corrosive stock is to be processed or if the operating conditions of the unit are changed, particularly by temperature increase, more resistant materials may be required. Materials usually exposed in oil-refining units are:

Carbon steel, cast iron, Ni-resist, 5 per cent chrome-moly steel, Type 304 steel, Type 316 steel, Monel, 70-30 copper-nickel, admiralty metal.

The number of sets of materials to be exposed depends upon the type of unit and stock processed. In general, three or four sets distributed throughout the length of a column are sufficient. The results from these sets will usually indicate whether or not additional sets should be exposed at other locations and whether more resistant alloys should be included.

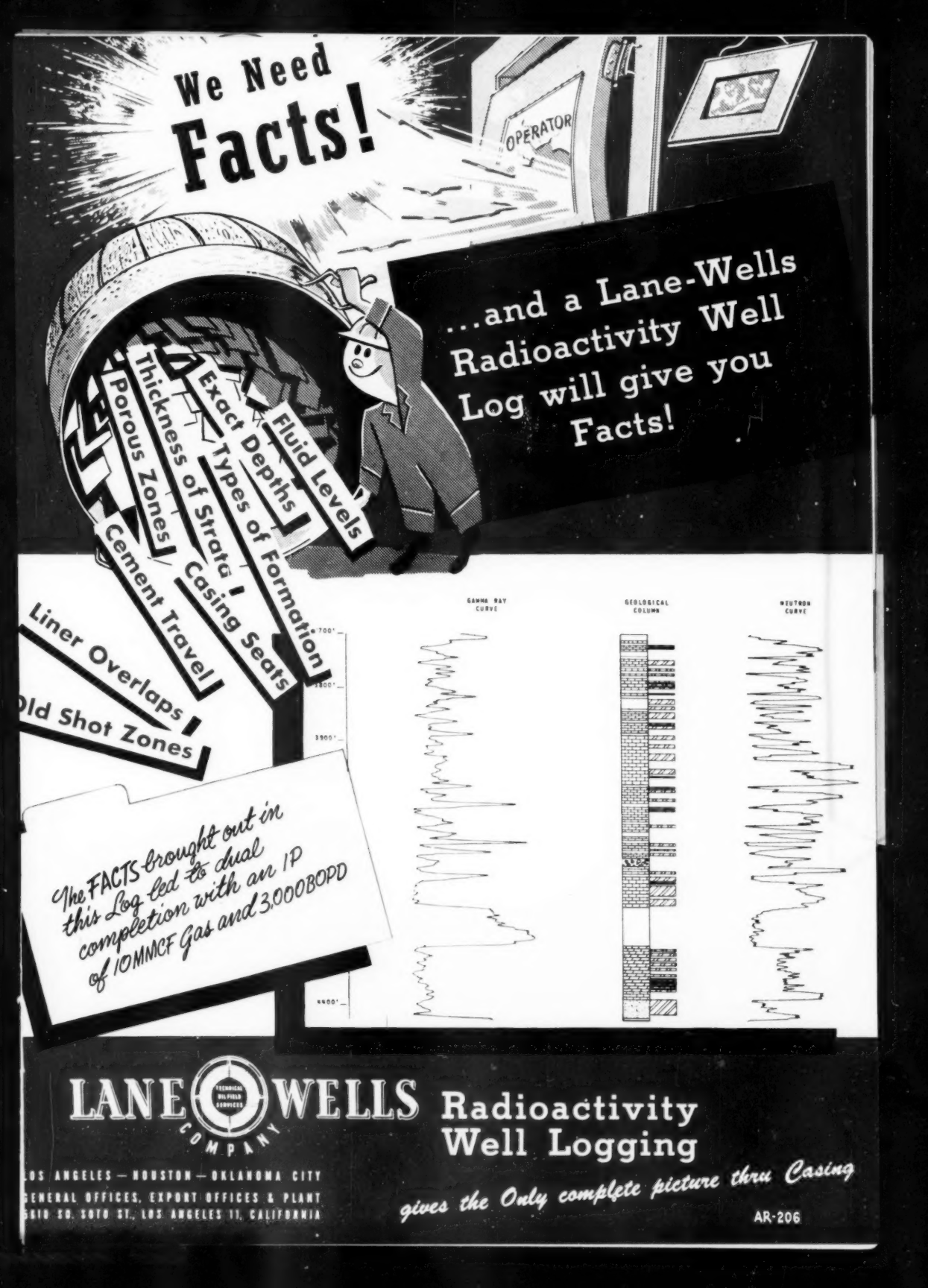
With the background of a complete record of past corrosion experience in the refinery or refineries, plus published information, the corrosion engineer will be in a good position to select adequate materials and corrosion allowances for maintenance purposes and for contemplated new equipment of similar design to that used in the past. He will, however, not necessarily have sufficient information for the selection of materials for a refining unit operating on a different principle.

Corrosion Tests in Pilot Plants

The proper selection of construction materials and corrosion allowances for new processes is often difficult. Some information can usually be obtained on specific parts of the process from laboratory corrosion tests. The best method, however, is to conduct extensive corrosion tests in pilot plants designed and operated to simulate actual plant conditions. Pilot-plant tests are expensive but the selection of materials by this means will nearly always result in practically trouble-free operation of the full-scale plant.

The use of pilot plants to obtain corrosion data can hardly be overstressed for new processes. In one case, the use of high-chrome steel or high-chrome-nickel steel was recommended for a process. The recommendation appeared sound. However, pilot-plant tests showed that these materials, while resistant for short periods of exposure, eventually failed rapidly. In fact, all commercial corrosion-resistant alloys were unsuitable which led to ceramic construction. This proved to be very satisfactory.

New processes which operate successfully on relatively noncorrosive stock may require corrosion-resistant materials for more corrosive stocks. For example, a pilot plant was constructed to check this point. The test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demonstrated that the use of carbon steel would have permanently shut down the unit after very short service, partly because of corrosion and partly because of catalyst contamination with iron oxide. While the test probably cost $50,000 to run, it was highly profitable.

Expected Life of Equipment Influences Materials Choice

One other important factor required when building a new unit is a knowledge of the expected useful life of the unit. This is particularly important for major equipment such as main fractionating columns. Very long and costly shutdowns may be required for repair if they reach the minimum allowable thickness before the process has served its usefulness. This has often happened in the past and could have been prevented, or at least delayed many years, at a relatively low cost, by using thicker metal during the original construction.

In one case on record, where corrosion rates were relatively low, only about $\frac{1}{8}$-in. corrosion allowance was provided. The $\frac{1}{8}$-in. thickness was corroded away in less than 10 years and the main fractionating column was repaired at a cost of $100,000. Also the unit was out of service for 3 months because of the repair. A corrosion allowance of $\frac{3}{8}$ in. on the shell and thicker internal members, along with some corrosion-resistant alloy parts, could have been originally provided for a cost of about $20,000.

The estimate of the expected useful life of major items of equipment such as fractionating columns, should, if possible, be based on past experience in similar units. For crude-fractionating units, the life may be quite long, possibly 20 years. For some types of operation, the life may be shorter because of the introduction of more economical processes.

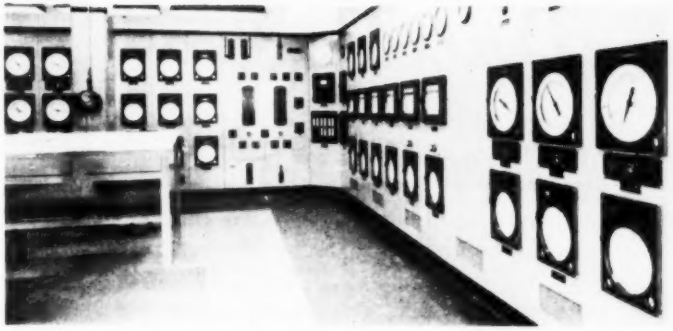
Most other individual parts of units, such as small vessels, lines, pumps, heat exchangers, and even furnace tubes can be replaced during a normal shutdown and will, therefore, not greatly reduce production. However, if many such parts require repair, a long shutdown will be required and maintenance costs will be very high. It is consequently also desirable to provide reasonably long life in these parts by the use of large corrosion allowances and corrosion-resistant materials.

Wood River Refinery

(Continued from page 75)

At a recycle ratio of 0.7 to 1, 42.5 volume per cent of the thermal charge was converted to gasoline. Octane rating of this Cycloversion gasoline with 3 ml. TEL per gallon was 89.0, research method.

Increasing the recycle ratio to 1.27 to 1 effected both an increased conversion to gasoline and a higher octane rating. At this higher recycle ratio, 59.1 volume per cent of the thermal charge was converted to 90.2 research octane gasoline (at 3 ml. TEL per gallon).



A portion of the Cycloversion unit's control room

A diagrammatic layout of the Perco Cycloversion process as employed in operations of Wood River Oil & Refining Co. is shown in Fig. 1. The two 12-ft. diameter by 18-ft. catalyst chambers are connected to the main heater with separate 8-in. vapor lines and with a common 10-in. vapor outlet line to the fractionator. Each of the heaters are equipped with three separate processing coils and a steam-generating coil. Both furnaces are arranged such that heat is supplied independently and automatically to each coil as determined by its outlet temperature.

The two other fired heaters in the process are of the vertical cylindrical type. One heater supplies processing heat to the stabilizer bottoms reboiler and to other heat-transfer points. Gas oil from the fractionator bottom is used as the heating medium. A similar heater is employed to superheat a portion of the steam generated in the main heaters for processing operations.

Catalyst capacity of the cycloversion chambers is 80,000 lb. of Cyclocel per chamber. These vessels are internally insulated with a 6-in. layer of gunite. Each chamber vapor outlet is connected to a waste heat exchanger. Heat thus removed from the vapor is also used for steam generating. These exchangers are of the U-tube type connected to the chamber outlet so that the hot vapor is on its shell side. Each of the waste heat exchanger shells is internally insulated with the same material as are the catalyst chambers.

Conventional in design, the 9-ft. diameter by 61-ft. fractionator is provided with a distillate drawoff deck and a reboiler for an external distillate stripper. Size of feed inlet line to the fractionator is 6-in. and its overhead vapor line 14-in. Reduction in size of the initial 10-in. vapor line from the chambers via the waste heat exchangers is made after it leaves a second heat-transfer unit. Heat removed from the fractionator feed by this second exchanger is utilized in heating feed water for the unit's steam-generating system.

Oil for the absorption of the separator gas from the fractionator overhead is supplied from the midsection of the fractionator. After enrichment in the absorber, the oil is returned to the fractionator one plate above its takeoff point. The 6-ft.-diameter stabilizer is of conventional design and is equipped with a reboiler. This reboiler is one of the various heat-exchange devices connected into the unit's circulating heating oil system. Gas separated from the stabilizer overhead along with the residue gas from the absorber is used for plant fuel.

Procedure for catalyst regeneration and the equipment employed therefor are conventional for the Cycloversion process. As an example a carbon-burning rate of 1,000 lb. per hour requires 35,000 lb. of 650° to 750° F. steam and 140,000 cu. ft. of air. Regeneration temperature is maintained within the range of 1,300° to 1,350° F.

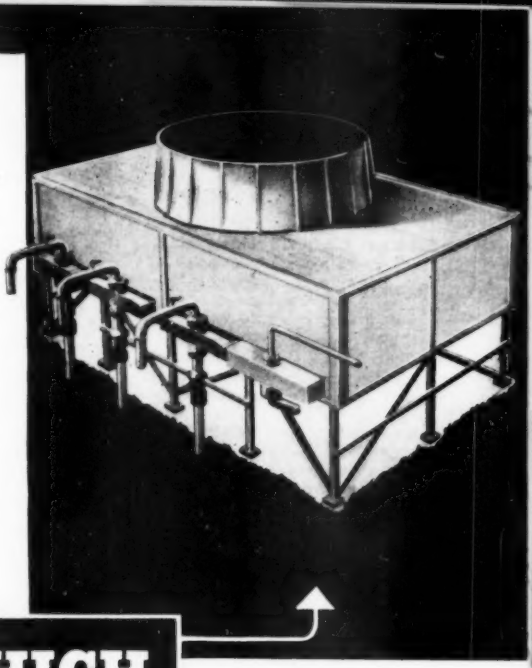
Engineering on the Cycloversion unit was handled by Koch Engineering Co., Wichita. The process is licensed under patents of the Perco Division, Phillips Petroleum Co.

Training Program Planned For L.P.G. Technicians

A course in gas-fuel technology will be offered this fall by Southern Technical Institute, a unit of Georgia Institute of Technology, at Chambles, Ga. Developed with the cooperation of the Liquefied Gas Association, the 18-month training period will be open to graduates of accredited high schools over the country. Classes will convene September 26.

The studies are designed to prepare students for entrance and advancement in the L.P.G. industry and other phases of the gas business.

DriCooler*



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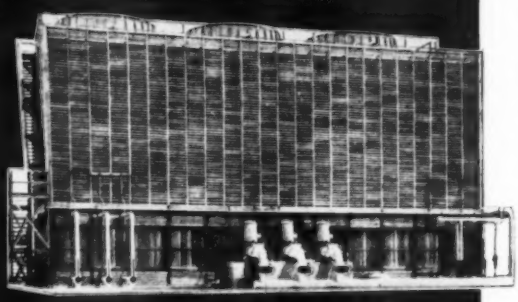

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PROGRESS in METALS

by W. L. Nelson
Consulting Engineer

Delivery of Rolled Structural Materials

THE A.S.T.M.'s new specification (A6) incorporates much of the material common to the several existing specifications on steel plates, shapes, and bars for structural use. As an example, the tolerance tables, testing details, etc., were removed from such specifications as A7 pertaining to steel for bridges and buildings (one of the oldest A.S.T.M. documents). Specification A6 is made available in a booklet entitled, "A.S.-T.M. Specifications for Rolled Structural Steel," which also includes the revised Tentative Specifications A7, A94, A113, A131, A141, A195, A242, A283, and A284. These are somewhat abbreviated as compared with older corresponding specifications because of much common material that could be incorporated into the new General Specification A6. Copies may be obtained from A.S.T.M. Headquarters, 1916 Race Street, Philadelphia, at $1 each.

Study Began in 1947

This study began in 1947 when it was realized that to incorporate in each individual specification all of the various tables and general requirements necessary to cover rather completely the necessary quality and related values, would mean a great amount of printing and considerable duplication among the standards. The scope clause of the new general requirement specification A6 is as follows:

This specification covers a group of common requirements which, unless otherwise specified in the purchase order or in an individual specification, shall apply to rolled steel plates, shapes and bars under each of the following specifications issued by the American Society for Testing Materials:

TITLE OF SPECIFICATION	A.S.T.M. designation
Steel for bridges and buildings	A 7
Structural Silicon steel	A 94
Structural steel for locomotives and cars	A 113
Structural steel for ships	A 131
Low-alloy structural steel	A 242
Structural rivet steel	A 141
High-strength structural rivet steel	A 195
Low and intermediate tensile strength carbon-steel plates of structural quality	A 283
Intermediate tensile strength carbon-Silicon steel plates for machine parts and general construction	A 284

While the changes in the condensed and revised product specifications, such as A7 (first printed in 1899 and adopted in 1901), in general result from the removal of material now in A6, other changes have been incorporated and numerous editorial clarifications have been made.

It can be said of these new specifications that they now include most of the important requirements for the designer and purchaser to get required quality from the materials. They include material that formerly was not a part of the standards, and it is believed the product specifications will be easier to use, and clearer because of the concentration on the essentials.

This move of establishing a specification with material common to several other product standards is being studied in other Committee A-1 groups, including Subcommittee XI on steel for Boilers and Pressure Vessels, and Subcommittee IX on Pipe and Tubing.

One leading authority who has had an important part in the work believes that this move will provide documents that are of greater convenience to both producer and user. The producer will know that the standard tolerances have been accepted by the user, and the user will, through representation in the A.S.-T.M. committees, be able to check and discuss, and improve tables and general conditions before they are standards. In general, the new setup will provide a more satisfactory background to the whole relationship between the producer and consumer of structural steel.

Forging Terms or Operations

SWAGING

A surface working operation of marking or shaping the stock between dies. This is accomplished by a rotary swaging machine, helve hammer, or a trip hammer.

Welding 4-6 Chromium Steel Pipe—A New Technique

DEVELOPMENT of a new procedure for welding 4 to 6 per cent chromium steel pipe was disclosed recently by M. Van Blaircom of Houston Pipe & Steel, Inc. In the new process a large preheating tip with oxyacetylene was used first to bring the temperature of the joint up to 600° to 800° F. and keep it there while the welding was done using G-E. chrome electrode Type W-1502 (A.S.T.M.-A.W.S. Spec. No. E-502). After this temperature was raised to 1,200° to 1,350° F. and the joint was wrapped with asbestos tape to a minimum thickness of 1 in. and cooled to room temperature.

This technique did not make the weld metal so hard that it became brittle. Test figures showed an ultimate tensile strength of 73,200 psi., and a satisfactory rating on a 180° root bend. Brinell hardness in the weld was indicated as 248, while Brinell hardness in the pipe was 174. A Charpy impact notched test made in the weld metal at 70° F. gave a value of 49.0 ft.-lb.

Where greater ductility and elongation was required, a furnace anneal at 1,600° F. was given after the pipe had cooled. This resulted in an average elongation of 40 per cent in 2 in.

A digest from the June 1949 issue of Materials and Methods.

Monel Resists Bay Water

THE performance of monel metal tubes is compared with regular condenser tubes in Vol. 8, No. 2 of the Process Industries Quarterly. The bay water used in the straight-run gasoline condensers of one West Coast refinery caused rapid destruction of regular condenser tubes (about 5 months' service). Monel metal tubes were installed in 1942 and it is estimated that the life of such tubes will be 60 - 72 months. Although Monel metal is expensive, the cost is by no means 12 to 1, and of course, the saving in operating time and labor is significant.

Aluminum Welding Fittings

Aluminum welding fittings and flanges for welding are now made available by Tube Turns, Inc. The fittings are available in alloys 3S, 61S, and R361, and the flanges in alloys 61ST6 or R361T6.

The usefulness of an all-aluminum piping is obvious in the processing of many chemicals or related substances, such as hydrogen-sulfide-laden gases, sour crude oil, sulfide-containing liquids, soaps or fatty acids, cosmetics, milk, beer, fruit juices, etc.

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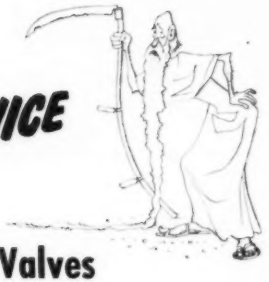

OUTSTANDING FEATURES OF THIS RECORD-BREAKING VALVE

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Dome pressure may be changed in field

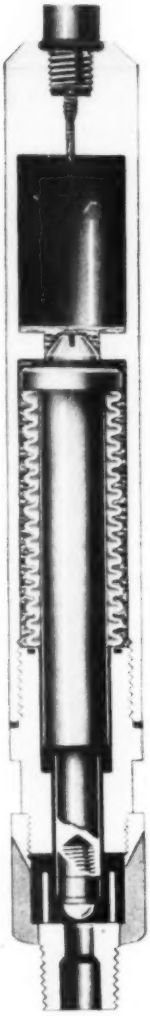
Firm and accurate valve seating, without chattering or metering

SIMPLE, POSITIVE ACTION!

Valve action is controlled entirely by injection gas pressure. After partial assembly of the valve, a non-compressible liquid is introduced outside the bellows. Assembly is completed and the pressure dome charged to desired pressure.

Dome pressure closes the valve. It remains closed until injection gas pressure (greater than the charge) is exerted on the opposite side of the bellows. The valve stem moves up, allowing gas from casing to enter tubing.

For full details of the construction and operation of the *Got-Olsco* Type "O" valve write to GARRETT OIL TOOLS, P.O. Box 6115. Houston 6, Texas. They'll send you information promptly — and without obligation.



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Phase Concepts—Phase State of Reservoirs

THE previous article in this series gave a discussion of the relative magnitudes of reservoir pressure and temperature, surface pressure and temperature, and composition of the reservoir mixture which would give rise to an oil reservoir with or without a gas cap. The same principles apply to the differentiation between other reservoirs.

Consider first the dry-gas reservoir. For such a reservoir, the relative position of surface pressure and temperature to reservoir pressure and temperature and of both to the phase diagram are shown in Fig 1. P_1 T_1 represents reservoir conditions and P T surface conditions. It is not sufficient to say for this situation that the point P_1 T_1 is in the vapor region. One must add also that the value of T_1 must be above the cricondentherm A. If it were below A, condensation might occur in the reservoir.

Should the surface value of temperature be within the two-phase region at the point T' rather than at T, the surface production would show an amount of liquid occurring as a natural gasoline or other volatile fraction. This would be, in effect, a condensate reservoir although differentiated from a retrograde condensate reservoir as outlined below. The relative amount of produced liquid occurring would depend upon the distance the surface temperature lies within the two-phase region.

Although the surface production would show only gas if the pressure and temperature were at P T, such production might be made to yield a liquid with the proper processing. One method of processing would be to lower the temperature to the point T' and remove the liquid which formed. Whether a specific gas can be so treated depends upon the distance the point P T is removed from the two-phase region. This distance is determined by the composition of the reservoir mixture that exists for the particular case in question. A gas rich in methane would give a diagram on which the dew-point line occurred at a higher pressure and lower temperature than if the gas were rich in higher components. Hence, in the former case surface temperature might be considerably to the right of the dew-point line and processing to recover liquid would not be practical.

Consider the retrograde condensate reservoir. On Fig. 1, the relative position of surface pressure and temperature for this situation is donated by P_2 T_2. The lower temperature limit for this occurrence is the critical temperature, T_c, and the upper temperature limit is the cricondentherm, A. The relative position of surface pressure and temperature may be either P T or P T'. If the former, it would not be obvious that the reservoir contained a retrograde condensate because surface production would show no condensate yield.

The phenomenon which gives this type reservoir different characteristics from the gas reservoir discussed above is the appearance of two phases, gas and liquid, when the reservoir fluid is subjected to a decrease in pressure. If the pressure drop occurs within the formation the two phases will form there. A loss of liquid recovery results because the gas phase will be produced more rapidly from the reservoir than will the liquid phase. This situation is due to the differences between relative permeability of a formation to gas and relative permeability to liquid. Differential production of the gas and liquid phases means that the composition of the mixture remaining within the reservoir would undergo change.

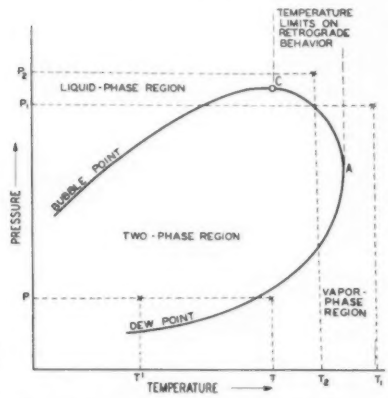

Fig. 1—Schematic diagram showing relative positions of reservoir conditions and surface conditions for gas and condensate reservoirs

In operating this type reservoir, therefore, it is advantageous to keep reservoir pressure high enough to insure the existence of a single phase within the formation as long as possible. The same reasons apply for keeping the reservoir pressure above the two-phase region even though the reservoir temperature may be below the value of T_c.

From the discussion concerning the relative positions of surface and reservoir temperature and pressures with respect to a phase diagram one can conclude that a given hydrocarbon mixture could exist under the proper reservoir conditions so that it would have the producing characteristics of an oil reservoir, condensate reservoir, or gas reservoir provided the relative position of surface pressure and temperature could be shifted at will.

Inasmuch as surface conditions are fixed within close limits, one does not find as a practical matter a given character of mixture in different type reservoirs. It is possible to correlate the character of specific hydrocarbon mixtures to one or another type of reservoir. Such correlations have been made by many investigators wthin the field. A recent one by Curtis and Brinkley[1] makes a rather comprehensive differentiation between oil and condensate type occurrences on the basis of gas-liquid ratios and saturation pressures.

Inasmuch as the depth of reservoirs being discovered is increasing there is a continually greater possibility that new reservoirs will produce condensate because the reservoir pressures and temperatures found will be greater. In particular, it is necessary only that the reservoir temperature be above the critical value.

Reference

1. Calculation of Natural Condensate Recovery, Curtis and Brinkley. Presented A.P.I. Mid-Continent spring meeting, Tulsa, March 23-25, 1949.

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Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Chemical Equipment—1

TABLE 1—APPROXIMATE COST OF INSTALLED EVAPORATORS,[1,2,4] 1946, DOLLARS PER SQ. FT.

Heating surface, sq. ft.	Std. horiz. tube	Std. vert. tube or bracket		Long tube vertical			Forced circulation	
	C.I. body, Cu. tubes, or all iron	C.I. body, Cu. tubes or all iron	Lead lined	All iron	C.I. body, Cu. tubes	All copper	C.I. body, Cu. tubes	Ni. C.I. body, Ni. tubes
100	41.50	48.50		16.0	24.7			
200	29.40	35.00	74.00	13.0	21.7	47.5	82.50	110.0
400	21.70	26.00	52.00	11.0	18.7	37.0	50.00	73.5
700	16.80	21.00	41.50	9.5	16.7	28.5	37.00	62.0
1,000	14.80	16.60	35.40	8.7	16.0	25.5	32.00	59.0
2,000	10.20	11.90	26.00	7.3	14.0	18.5	26.50	52.0
4,000	7.15	8.45		6.0	12.3		23.40	46.5
7,000	...	...	...	5.0	10.8			
10,000	...	...	...	4.6	10.2			
20,000	...	...	...	3.9	8.6			

TABLE 2—APPROXIMATE INSTALLED COST (1946) OF DRYERS,[1,2,3] DOLLARS EACH

Peripheral area, sq. ft.	Drum type	Rotary dryers or kilns: Hot-air heated—Steel	Hot-air heated—Stainless	Flue-gas heated—Direct	Flue-gas heated—Indirect
10	4,350				
40	8,000				
100	11,600	2,600	11,300	3,400	4,500
200	15,400	4,700	25,000	6,100	8,700
400	21,000	8,700	59,000	12,200	17,000
700		15,200	112,000	20,500	29,000
1,000		19,500	174,000	28,000	41,500
2,000		35,500		54,000	78,000
4,000				105,000	

TABLE 3—APPROXIMATE INSTALLED* COST (1946) OF GRAY-JENSEN SPRAY DRYERS[2]

Evaporative capacity,† lb. H_2O per hr.	Installed* cost, dollars	Connected hp.
3,000	41,000	46
4,000	45,000	30
5,000	50,000	54
6,000	54,000	60
7,000	59,000	67
8,000	63,000	73
9,000	68,000	83
9,700	72,000	93

*Labor is about 15 per cent. †Based on 300° F. inlet gas temperature. Capacity increases about 35 per cent for each 100° F. increase in inlet gas temperature.

TABLE 4—APPROXIMATE INSTALLED COST (1946) OF CRUSHING AND GRINDING EQUIPMENT,[1,2,7] DOLLARS EACH

Driver horsepower	Swing hammer bar	Jaw and rotary crushers	Ball mills*	Roll crushers and mikro pulverizers	Gyratory crushers	Rotary cutters
1		670				
3		1,270		1,500		
6	820	2,000		2,400		
10	1,130	2,600	3,000	3,400		8,100
20	2,000	4,000	4,400	5,300	6,800	12,500
40	3,350	5,900	6,700	8,500	10,700	19,500
70	5,100	8,200	10,000	12,000	16,000	
100	6,700	10,000	12,000		20,000	
200	10,700		18,000		33,000	
400	18,000		27,000			

*Correlation by Chilton[1] based on horsepower requirements when operating on a medium hardness material being reduced from 1½ in. to 90 per cent that passes 100 mesh. See Perry[4] for other conditions.

TABLE 5

Approximate Delivered Cost (1946) of Crystallizers[5] (Swenson-Walker) Complete with Drives, Dollars Per Foot*

Total length, ft.	Dollars per ft.
20	95
60	74
90	71
120	64
240-360	62
400-800	58
1,000-1,200	57

*Usually built in units 10 ft. long and up to four units can be driven from one shaft. Multiple units are arranged one above the other

References

1. Chilton, C. H., Cost Data Correlated, Chem. Eng., June 1949, p. 97.

2. Anon., Estimating Spray Dryers, Chem. Eng., May 1947, p. 125.

3. Bliss, H., Data for Cost Estimates, Chem. Eng., May 1947, p. 126.

4. Perry, J., Chemical Engineers Handbook, 2nd. Ed., McGraw-Hill Book Co., N. Y., 1941.

5. Riegel, E. R., "Chemical Machinery," Reinhold Publ. Co., N. Y., 1944.

6. Tyler, C., "Chemical Engineering Economics," 3rd Ed., McGraw-Hill Book Co., N. Y., 1948.

7. Bliss, H., Equipment Cost Estimation, II, Chem. Eng., June 1947, p. 100.

No. 43 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

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1 **Uniform Roundness**—Pipe ends match up perfectly—speed construction—cut costs.

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4 **Uniform High Yield Strength**—Permits building of higher pressure lines—utilizing design values to fullest advantage.

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6 **Easy to Bend**—High-ductility steel makes bending in the field easy.

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8 **Freedom from Scale**—Insures against clogged valves, contamination of petroleum products.

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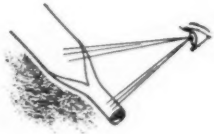

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PIPE LINES

Contracts for 857 Miles Awarded by Mid-Valley

CONTRACTS have been awarded by Mid-Valley Pipeline Co. for 9 of the 10 sections of its 1,000-mile Longview, Tex.-Lima, Ohio, crude-oil pipe line, according to an announcement by William C. Kinsolving, president of Mid-Valley. Contracts for the nine sections cover a total of 857 miles of line and for its Mississippi River crossing.

This combination 20 and 22-in. pipe line will be one of the largest crude-oil lines in the country, and will require an investment of approximately $56,000,000. It will be financed through purchase of Mid-Valley stock by Standard Oil Co. (Ohio) and Sun Oil Co., and by additional funds borrowed from banks and insurance companies.

Contract for construction of Section 1, from Longview to Haynesville, La., will not be awarded until early in 1950, when bids for this section will be reopened. Construction contracts announced are as follows:

Section 2: 120 miles of 20-in. pipe from Haynesville, La., to Mayersville, Miss., awarded to Latex Construction Co., Houston. Work will start late this fall.

Section 3-A: 111 miles of 22-in. pipe from Mayersville, Miss., to near Oakland, Miss., awarded to Associated Pipe Line Contractors, Inc., Houston. Work will start in December.

Section 3-B and 4-A: 111 miles of 22-in. pipe from near Oakland, Miss., to Henderson, Tenn., awarded to Eastern Construction Co., Dallas. Work will start in December.

Section 4-B and 5-A: 111 miles of 22-in. pipe from Henderson, Tenn., to Clarksville, Tenn., awarded to Eastern Construction Co., Dallas. Work will start in December.

Section 5-B and 6-A: 111 miles of 22-in. pipe from Clarksville, Tenn., to Elizabethtown, Ky., awarded to Britton Construction Co., Fort Worth. Work will start in December.

Section 6-B: 111 miles of 22-in. pipe from Elizabethtown, Ky., to Hebron, Ky., awarded to H. L. Gentry Construction Co., Jackson, Mich. Work will start in December.

Section 7 South: 60 miles of 20-in. pipe from Hebron, Ky., to a point northeast of Eaton, Ohio, awarded to Britton Construction Co., Fort Worth. Work will start in October.

Section 7 North: 60 miles of 20-in. pipe from a point northeast of Eaton, Ohio, to Lima, Ohio, awarded to Mahoney Construction Co., Mt. Pleasant, Mich. Work will start in October.

Section 8: 21 miles of 8-in. pipe from Magnolia, Ark., to Haynesville, La., awarded to Latex Construction Co., Houston. Work will start in the early fall.

Section 9: 41 miles of 12-in. pipe from Delhi, La., to Mayersville, Miss., awarded to Latex Construction Co., Houston. Work will start in the early fall. The Mississippi River crossing at Mayersville, Miss., was also awarded to Latex Construction Co., Houston. This will be two 20-in. lines under the river.

Both Sun and Sohio operate refineries in Ohio and expect to tender crude oil to Mid-Valley from production fields in Texas, Arkansas, Louisiana, and Mississippi.

Humble to Start Work on 18-in. Line This Year

An $18,000,000 375-mile, 18-in. pipe line from West Texas to the Gulf Coast will be started by Humble Pipe Line Co. toward the end of 1949, and will be completed around the middle of 1950.

The new line will extend in a direct route from Kemper in Reagan County, Texas, to Satsuma, 20 miles north of Houston, where it will connect with Humble's existing lines to Baytown. It is being built to provide a more economical transportation system for Humble from West Texas. Upon completion of the line, Humble plans to take up a part of its old system from West Texas to Baytown by way of West Central Texas which has a capacity of 50,000 bbl. per day. No changes are contemplated in Humble's other line from West Texas with a capacity of 70,000 bbl. per day to Corpus Christi.

The new line will have an initial capacity of 95,000 bbl. per day with one intermediate station between Kemper and Satsuma. The capacity can be increased to 120,000 bbl. per day by the addition of a second intermediate station.

Northern Natural Rejects Trunkline Gas Contract

Northern Natural Gas Co. rejected the proposed gas-purchase contract with Trunkline Gas Supply Co. at a meeting of the board of directors which authorized officers of the company to apply to Federal Power Com-

At the beginning of 1949—a total of 37,700 miles of pipeline was planned for construction. Participating in such an important phase of the industry today, a company has got to be OK! 30 years of experience, which includes participation in major sections of the world's greatest pipelines, means world-wide pipelining "know-how" every step of the way — when Oklahoma Contracting is on the job!

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mission for authorization to increase transmission capacity of its system in 1950 to 550,000,000 cu. ft. and in 1951 to 700,000,000 cu. ft. daily and to actively undertake acquisition of gas reserves to support the program as well as to provide for adequate distribution in the company's market area.

Arrangements have been made which insure procurement of sufficient pipe for the expansion undertaking.

Kaiser-Basalt to Furnish 22-36-in. Steel Line Pipe

A current expansion program will put Basalt Rock Co. in a position to operate facilities at Napa, Calif., early in 1950 for making expanded electric-fusion-weld steel pipe ranging from 22-in. to 36-in. in diameter with high yields required by the oil and gas industries, according to a joint announcement made by Henry J. Kaiser, president, Kaiser Steel Corp., and A. G. Streblow, president, Basalt Rock Co.

At Basalt's Napa plant a Yoder electric resistance-welding unit will be installed early in September. Plate will come from Kaiser's Fontana, Calif., mill. Kaiser will market the pipe as Basalt-Kaiser steel pipe. Upon completion of separate expansion programs which include new pipe-making facilities of Basalt's Napa and Kaiser's Fontana plants, Kaiser Steel's organization in combination with Basalt will be able to offer a complete range of steel pipe in sizes from ½-in. to 36-in.

Texas Illinois Applies For 1,018-Mile Line

Texas Illinois Natural Gas Pipeline Co., a newly formed subsidiary of Peoples Light, Gas & Coke Co., Chicago, has applied to Federal Power Commission for authorization to construct and operate a 1,018-mile natural-gas pipe line from the Gulf Coast area of Texas to a point near Joliet, Ill. Estimated cost of the project is $98,966,700.

In its application Texas Illinois stated that the proposed line, which would be of 30-in. external diameter, would run from a "yet undetermined" location in the area around Houston. According to reports it will run via points 12 miles south of Texarkana, Tex.-Ark., and 6 miles north of Corning, Ark., to a Mississippi River crossing about 17 miles north of Cape Girardeau, Mo., whence it will extend to a connection with the Natural Gas Pipeline Co. of America system near Joliet.

The company explained that it expects to make sales of gas directly to utility companies which are now buying from Natural Gas Pipeline Co. of America and its affiliate, Chicago

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District Pipeline Co., and perhaps also to other utilities operating in the general territory adjacent to the proposed new line.

Texas Illinois proposes to begin construction of the new pipe line, which would have an initial capacity of 300,000,000 cu. ft. per day, by October 1950, and to complete the job before November 15, 1951.

Tennessee Gas Transmission Seeks New England Permit

Tennessee Gas Transmission Co. has filed an application with Federal Power Commission in Washington, D. C., seeking authority to extend its natural-gas pipe-line system to New England, it was announced at the company headquarters in Houston.

The company asked for authorization of an increase in the daily capacity of the system to 1,260,000,000 cu. ft. The extension and expansion sought would cost an estimated $94,000,000.

When completed into New England, the company's system would be approximately 2,142 miles long, 1,759 miles of which have already been authorized by the FPC.

The latest in a long series of moves first inaugurated by the company in October 1947 to bring natural gas into New England was announced by Gardiner Symonds, company president. Tennessee Gas Transmission has been steadily building up its pipe-line system to serve New England since that time and only recently received a FPC certificate of public convenience and necessity to extend its main transmission line from Morehead, Ky., near the present terminus, to a point near Buffalo.

The company then filed its application for authority to extend the system 383 miles from the authorized temporary terminus near Buffalo to Worcester, Mass.

The application, in addition to asking authority to construct the 383-mile, 26-in. line to New England from Buffalo, also asks authority to construct 543 miles of 24, 26, and 30-in. "loop" lines paralleling the existing main transmission line, to construct four new compressor stations totaling 34,000 hp. and to enlarge existing compressor stations by 51,200 hp.

The company now is expanding the existing system to raise the daily capacity from the present 615,000,000 cu. ft. to 831,000,000 cu. ft. and will immediately start on the expansion program, just authorized by the FPC to raise the daily capacity to 1,060,000,000 cu. ft. This includes the 395-mile extension to Buffalo.

Tennessee Gas' new application to increase the capacity another 200,000,000 cu. ft. daily and extend to New England, states that the extension will serve an area in Ohio, New York, and New England with a population of approximately 7,000,000.

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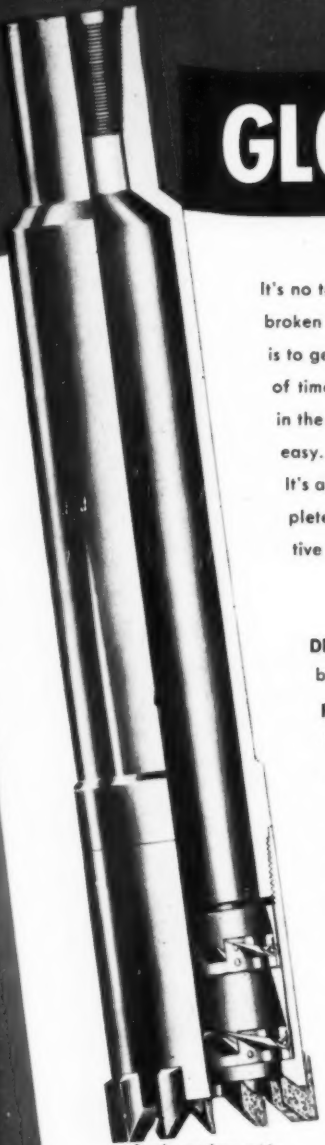

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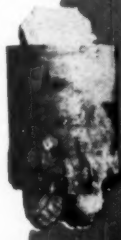

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(United States and Western Canada)

Area	Week ended 8-1-49	Change week ended 7-25-49	Change week ended 8-2-48
Gulf Coast	505	—6	—50
W. Tex.-N. M.	510	—6	—96
Ark.-N. La.-E. Tex.	167	+2	—2
Oklahoma	234	+8	—51
Kansas	114	—5	—28
Illinois-Eastern	130	+13	+2
Rocky Mountains	111	—3	—60
Pacific Coast	155	—2	—39
Total U. S.	1,926	+1	—324
Western Canada	74	+2	+24
Total	2,000	+3	—300

*Courtesy Hughes Tool Co.

Dietler Becomes Director Of Williams-Copeland, Inc.

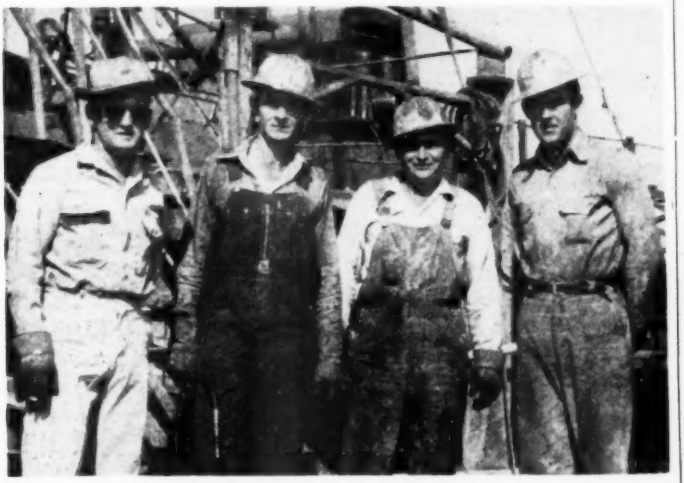
Williams-Copeland, Inc., Tulsa, has announced the addition of Cortlandt S. Dietler, formerly Rocky Mountain representative of Toronto Pipe Line Co., Casper, as a director and official of its organization. The company currently is operating 7 rotary rigs in Kansas, Oklahoma, and Texas, and is particularly active as a contractor in deep development in the Elk City field, Beckham and Washita counties, Oklahoma. C. M. Copeland is president and O. D. Williams, vice president.

Parker to Drill 10 Wells For Amerada at Redwater

Parker Drilling Co., Tulsa, is operating 2 rigs on a 10-well drilling contract which it has been awarded by Amerada Petroleum Corp. for the development of a Crown Reserve lease which the latter company recently acquired in the heart of the prolific Redwater field, northeast of Edmonton, in Alberta Province, Canada. The lease, which comprises all of 16-57-21w4, is one for which Amerada paid the Alberta government a bonus of $3,250,000. Contracts for the 6 additional wells which the section will provide on the field's 40-acre spacing pattern have not been awarded.

Theck & Cross Drilling Co., Inc., San Angelo, Tex., has taken a farmout from Atlantic Refining Co. in the TW&NG survey, 10 miles northeast of Sonora, Sutton County, West Texas, and has made location in Section 78, Block 9, for its first test, which will be drilled for its own account. The test is projected to 6,500 ft., for a look at the Ellenburger. Stuart and Sherman Hunt and James Landrum are the present owners of the company.

Hollandsworth Drilling Co., Longview, Tex., as contractor and joint operator with Magnolia Petroleum Co., is planning to drill a Travis Peak



Day-tour crew for D. & J. Drilling Co., operating for Rothschild Oil Co. in the Placerita field, Los Angeles County, California. Left to right: L. P. Rush, driller; R. E. Sharp, cathead; M. B. Sharp, lead tong; and F. B. Wilson, derrick

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exploratory test in the Patroon area, Shelby County, eastern Texas. Tentative location is in the H. B. McGuire survey.

Brinkerhoff Goes to Canada

Robert W. Brinkerhoff, Dallas, has been transferred to Calgary, Alta., Canada, as resident manager of Brinkerhoff, Ltd., Canadian drilling affiliate of Brinkerhoff Drilling Co., Casper and Dallas. He is a brother of Zack Brinkerhoff, Jr., partner in both companies.

Dixie Drilling Co., Houston, is drilling a 9,500-ft. test for Union Oil Co. on the latter's Paul Miller lease in the East Moss Lake area, Calcasieu Parish, Louisiana Gulf Coast.

Murfin Drilling Co., Wichita, is starting a rank wildcat test for itself and others in Rice County, Kansas. It will be 1 Sims, 9-19-16. Nearest production is 6 miles southeast in the Smyres pool.

Quaker Drilling Co., Wichita, is drilling a wildcat test for Alpine Oil & Royalty Co. 2 miles east of the Richardson pool, Stafford County, Kansas. It is 1 Figger, NE NE SE 22-22-11.

Harbar Drilling Co., Oklahoma City, is starting two wells for Mazda Oil Corp. in Major County, Oklahoma. One is a south offset to the recently completed discovery well of the West Ringwood pool. It is 1 Robinson, located in 31-22n-10w. The other will be 1 Lewis, 4-21n-10w, in the original Ringwood pool, 2 miles to the east.

Delta Drilling Co., Tyler, Tex., has been awarded contract to drill a 12,500-ft. Smackover lime wildcat test for Tide Water Associated Oil Co. on the Kelsey dome in Upshur County, East Texas. Location is on the Wade lease in the John H. Field survey.

Livermore Drilling & Exploration Co., Lubbock, Tex., has the contract for a 7,500-ft. wildcat test being started for Charles H. Osmond in northeastern Roosevelt County, New Mexico. It is on the Haynes lease in 24-1n-36e.

White & Webb Drilling Co., Dallas, is starting a second well for R. W. Fair in the Cedarvale area, Kaufman County, Texas, where a new pool recently was opened in the Paluxy sand. The new well is a southwest offset to the discovery producer. It is in the B. S. Newman survey.

Trinity Drilling Co., Dallas, is rigging up to drill a 11,500-ft. exploratory test for Atlantic Refining Co. in 13-15s-37e, Lea County, New Mexico.

Calvert & Willis, Inc., Olney, Ill., an active contracting firm in the Illinois basin area, is expanding its geological staff by the addition of Jack Small, formerly associated with Central Pipe Line Co. Small will be assistant to F. W. Mitchell, chief geologist.

Viersen & Cochran, Oklahoma City, has been awarded contract by British American Oil Producing Co. to drill 1 Childers, 7-5n-14e, a rank wildcat location, 5 miles west of McAlester, Pittsburgh County, Oklahoma. Contract is for 7,800 ft. with the Cromwell sand as the primary objective.

Wright, Clark & Senkel, Graham, Tex., will drill a wildcat test for Sinclair Oil & Gas Co. and Cities Service Oil Co. on the SMS Ranch, Block 172, BBB&C survey, Throckmorton County, Texas. The location is 3 miles east of a small Caddo discovery oil well, recently completed on the same ranch.

Sam Tennant Drilling Co., Blackwell, Okla., is the contractor for Swiss Oil Co. of Dallas on a Cromwell sand test which the latter is starting in 12-8n-8e, in the Buckner pool area, 9 miles north of Holdenville, northwestern Hughes County.

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HOUSTON

REFINING

Bids Received for Work on California Standard Plant

Standard Oil Co. of Caliornia received bids early this week from selected bidders for construction of new refining facilities at Salt Lake City.

Bids were received for both fluid catalytic cracking and Houdriflow catalytic cracking installations and selection of the process will depend on estimated costs and guarantees submitted by the contractors. Successful bidder is expected to be announced shortly.

Several buildings are involved in the new construction, including a 6,000-sq. ft. storehouse. Chicago Bridge & Iron Co. has already contracted to build 145,000-bbl. additional storage space at the refinery.

Esso Standard to Lay Off 175 Linden Plant Workers

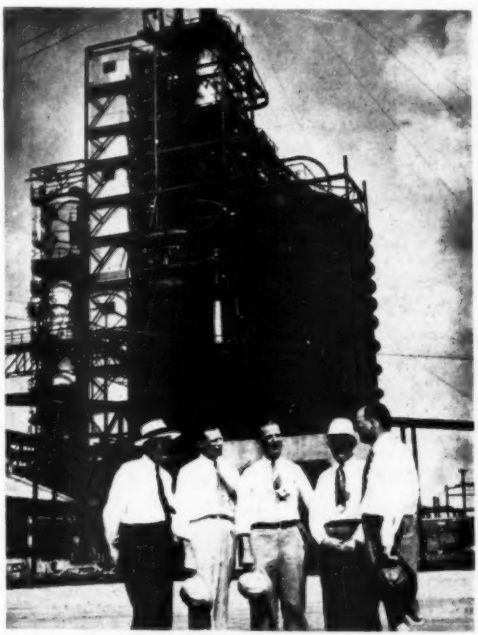
With completion of Esso Standard Oil Co.'s expansion program at its Bayway refinery at Linden, N. J., J. R. Eiffe, general superintendent of the plant announced that it will be necessary to reduce construction forces by approximately 175 men on August 12.

Since start of the expansion program 2 years ago, more than 600 men had been added to supplement the refinery personnel and provide manpower in addition to contractors forces for construction and operation of new facilities. The expansion project includes a 49,000 bbl. per day vacuum pipe still, a 41,000 bbl. per day catalytic cracking unit, a new steam boiler and generator, together with new sewer, water, and attendant oil lines to tie the new units in with existing facilities.

Lion Chemical Plant Work To Be Completed Soon

All remaining principal expansion projects now under way at Lion Chemical Co.'s plant at El Dorado, Ark., are expected to be completed and in operation on or before September 1.

These projects include a sulfuric acid plant, an ammonium sulfate plant, and an ammonium nitrate prilling plant. They represent an additional capital expenditure of approximately $3,000,000, apart from the cost of the ammonia plant expansion. The ammonium plant expan-



Inspecting installation of the new 195-ft. fluid catalytic cracking plant at Standard Oil Co. (Ohio) refinery at Lima, Ohio, are, left to right: H. E. Widdell, president of Arthur G. McKee Co., builders of the cracking unit; Elliott B. McConnell, Sohio's vice president in charge of manufacturing; Seward R. Bolles, Lima refinery manager; William J. Ferguson, mayor of the City of Lima; and Dr. F. J. Sanders, technical manager for Sohio's manufacturing department. The unit, part of Sohio's $30,000,000 expansion and modernization program at Lima, will go on stream in October. (See The Oil and Gas Journal, August 4, 1949, page 24)

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sion cost an additional $3,500,000. Work was completed in July, and production has now reached an all-time high.

Leuders, Tex., Refinery Will Be Closed Down Soon

Panhandle Producing & Refining Co.'s refinery at Leuders, Tex., will close down shortly. The company announced that it has discontinued purchase of crude oil and will complete refining of crude on hand by August 15. The plant has been handling approximately 1,200 bbl. of crude oil daily. Purchase of crude formerly taken by the refinery will be taken over by Humble Oil & Refining Co.

Officials of Panhandle refinery blamed the closing on the general market conditions brought about by excessive imports of foreign crude oil, which have resulted in greatly depressed prices for fuel oils, particularly heavy residual oils. They reported that the result has been the difference between profit and loss.

Humble Awards $100,000 Refinery-Unit Contract

HOUSTON.—Humble Oil & Refining Co. has awarded a $100,000 contract to Telepsen Construction Co., Houston, for construction of a locker building at the firm's Baytown, Tex., refinery.

The proposed two-story building will be erected on a concrete foundation and have a structural steel frame. It will include exterior walls of tile and brick, quarry and ceramic tile floors, built-up roof, and concrete roof deck.

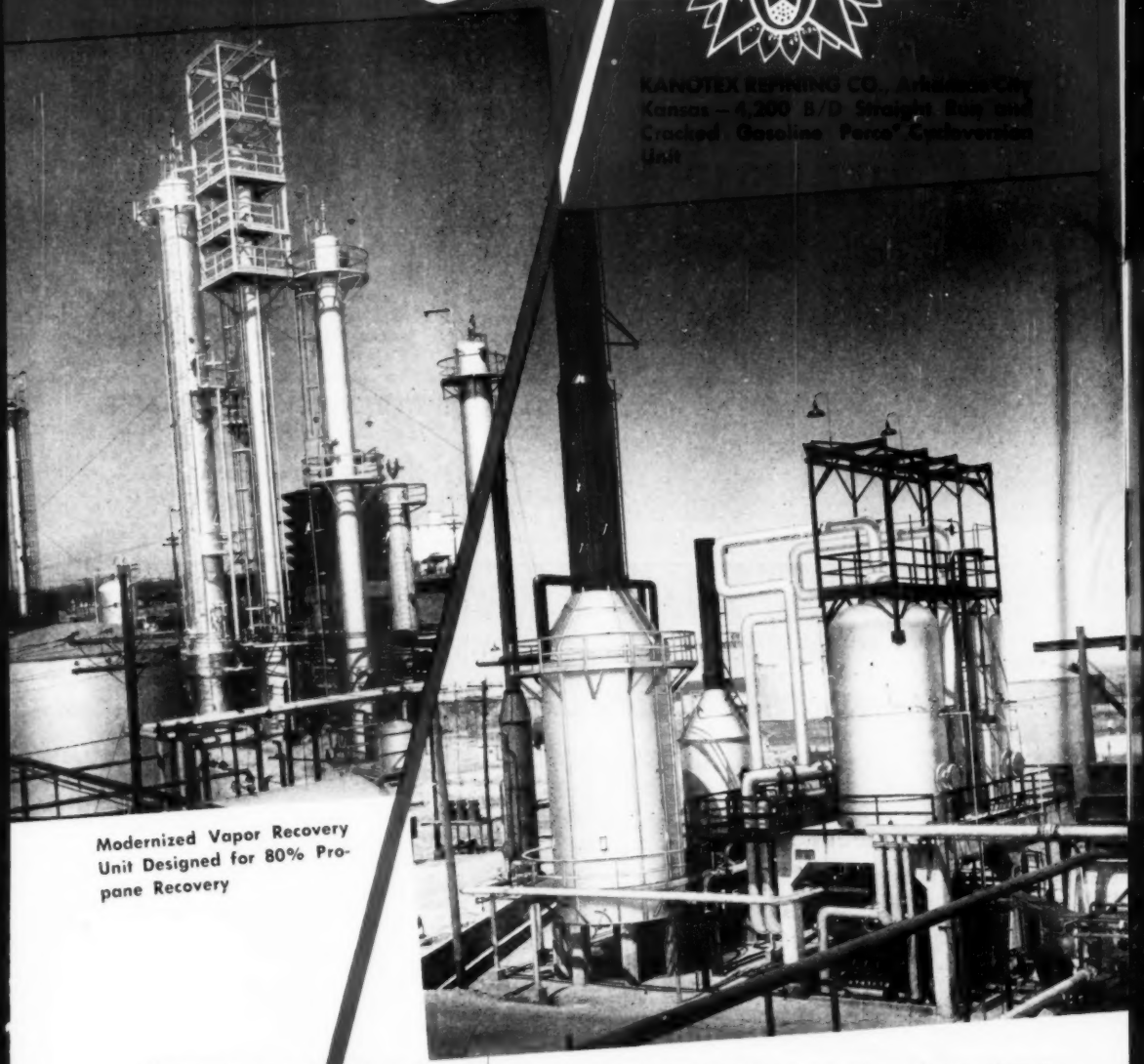
W.P.R.A. Regional Meeting To Be Held in Alma, Mich.

A regional technical meeting of Western Petroleum Refiners Association will be held in Alma, Mich., August 19, John C. Day, Tulsa, executive secretary of the association, announced. The 1-day meeting, to convene at the plant of Leonard Refineries, Inc., will consist of a symposium on diesel fuels, particularly those used for high-speed engines.

A discussion of "Relationship Between Composition and Ignition Quality of Diesel Fuels" will be given in a paper by C. C. Ward, chemical engineer with U. S. Bureau of Mines, Bartlesville, Okla., and other papers will be delivered on pertinent subjects. Reid Brazell, Leonard Refineries president, will serve as chairman.

Meanwhile the board of directors of W.P.R.A. announced the selection of San Antonio, Tex., as the city in which it will hold its thirty-eighth annual meeting. Headquarters will be in the Plaza Hotel, with dates set for March 27-29, 1950.

OK KANOTEX



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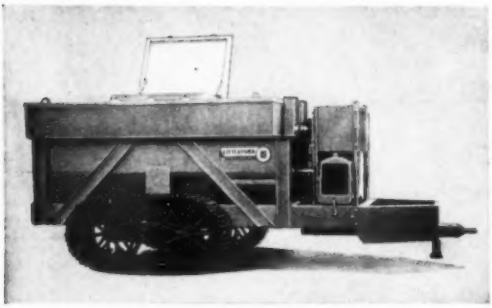

HYDRAULIC AGITATED KETTLE . . . Model 211-20. This kettle has only one burner furnishing the heat—lights instantly—no preheating—no electrical ignition—burns diesel fuel or kerosene—burner is low pressure type assuring even distribution of heat which prevents warping or burning out bottoms—made with Trac-Type wheels or Skids for truck mounting.

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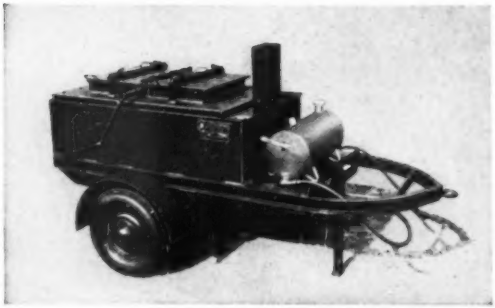

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NATURAL GAS

Texas Eastern Transmission To Sell Its Surplus Gas

Federal Power Commission has authorized Texas Eastern Transmission Corp. to deliver and sell, on an interruptible basis, surplus natural gas presently available on its pipeline system to gas-utility companies which are authorized firm purchasers, and to install metering and regulating equipment necessary to make the deliveries.

Texas Eastern reported the surplus, which will range from 60,290,000 cu. ft. daily in summer months to 24,250,000 cu. ft. daily in October, resulted from a lessened demand among some of its customer companies, and because other authorized purchasers have not yet constructed facilities to connect with Texas Eastern's system.

FPC denied the company's proposal to sell to utility companies or other concerns not authorized as customers of the system of any quantities of gas remaining after the demands of its authorized customers were met.

Texas Governor Signs New Carbon-Black Tax Bill

Gov. Allan Shivers of Texas last week signed a tax bill on carbon black which caused a dispute during the fifty-first legislative session between the state senate and the late Gov. Beauford Jester.

The legislative body refused to accept Jester's suggestions for changes in the bill. He had sent it back to the upper chamber after its passage by both houses.

As finally passed and signed, the measure allows the state to tax carbon black made by any method from natural gas. An amendment of Sen. Grady Hazelwood of Amarillo which would have made carbon black manufactured from crude oil taxable was killed in the senate.

Three Firms Ordered to Comply on Filing Rules

Three natural-gas pipe-line companies proposing to serve markets in the southeastern states have been ordered by Federal Power Commission to comply with the commission's rules and regulations governing the filing of applications for certificates of public convenience and necessity. In all three cases applications now on file with FPC are deficient in supplying information and exhibits required by FPC rules.

The companies are Piedmont Natural Gas Corp., which proposes to serve areas in South Carolina, North Carolina, and Virginia; Southern Natural Gas Co., which proposes to serve markets in southern Georgia, northern Florida, and southeastern South Carolina; and Atlantic Gulf Gas Co., which contemplates service to approximately the same areas as Southern Natural, and in addition, to southern Alabama. Joint hearing on the latter two applications has been scheduled in Washington, D. C., August 22.

Mississippi River Fuel to Increase Its Gas Service

Mississippi River Fuel Corp., which will install additional compressor facilities to increase natural-gas capacity of its system to 400,000,000 cu. ft. daily, next year, announced that it will be in a position to provide natural-gas service to domestic and industrial consumers in eastern Arkansas by the fall of 1950.

W. H. Marbury, president, said the company is now expanding its facilities to provide 266,000,000 cu. ft. of gas daily by January 1. This amount will be required by present customers, however.

The corporation transmits, but does not distribute, natural gas from main lines from Monroe, La., to St. Louis, and smaller auxiliary.

Natural Gasoline

Maysville Gasoline Plant, Repressure Unit Operating

The Maysville light hydrocarbons manufacturing and repressuring project undertaken jointly by five companies in the "Golden Trend" area of Oklahoma now is in full operation following the completion of the Maysville unit.

The project, engineered to process approximately 81,000,000 cu. ft. of gas daily with a production of approximately 225,000 gal. daily of natural gasoline and liquefied petroleum gases, was developed jointly by Cities Service Oil Co., Carter Oil Co., The Texas Co., J. E. Crosbie, Inc., and Warren Petroleum Corp. The latter corporation supervised construction and is operating the three plants.

The Antioch and Lindsay units, located near those respective towns, are remoted compression and absorption plants. The Antioch plant has a total of 9,600 compressor horsepower and is rated to pass 31,500,000 cu. ft. of gas daily obtained from Southwest Antioch and Elmore City pools, and to handle approximately 25,000,000 cu. ft. for repressuring purposes. The Lindsay plant has 8,000 compressor horsepower and is rated to pass 36,500,000 cu. ft. of gas daily from North Lindsay, East Lindsay, and New Hope pools.

The Maysville unit, in addition to having 3,800 compressor horsepower handling approximately 13,000,000 cu. ft. of gas daily from Maysville and Southwest Wayne pools, also contains all equipment necessary to fractionate the light hydrocarbons recovered by all three plants. The fractionation is accomplished by continuous pipe-line circulation of the absorption oil between both the Antioch and Lindsay plants and the Maysville plant.

Operations Under Way at Burnell-North Pettus Plant

Operations have started at the new Burnell-North Pettus cycling plant near Pettus, Tex., and F. J. Schempf, Texas-Louisiana Gulf Coast division manager for Stanolind Oil & Gas Co., plant operator, announced it would be running at capacity in a few weeks.

Situated 5 miles northeast of Pettus in Bee County, Texas, the plant is a joint project of Stanolind and others, and will produce more than 285,000 gal. of liquid products daily when operating at capacity of 166,000,000 cu. ft. of gas daily. Stanolind, as owner of the largest interest, supervised engineering design and construction of the installation.

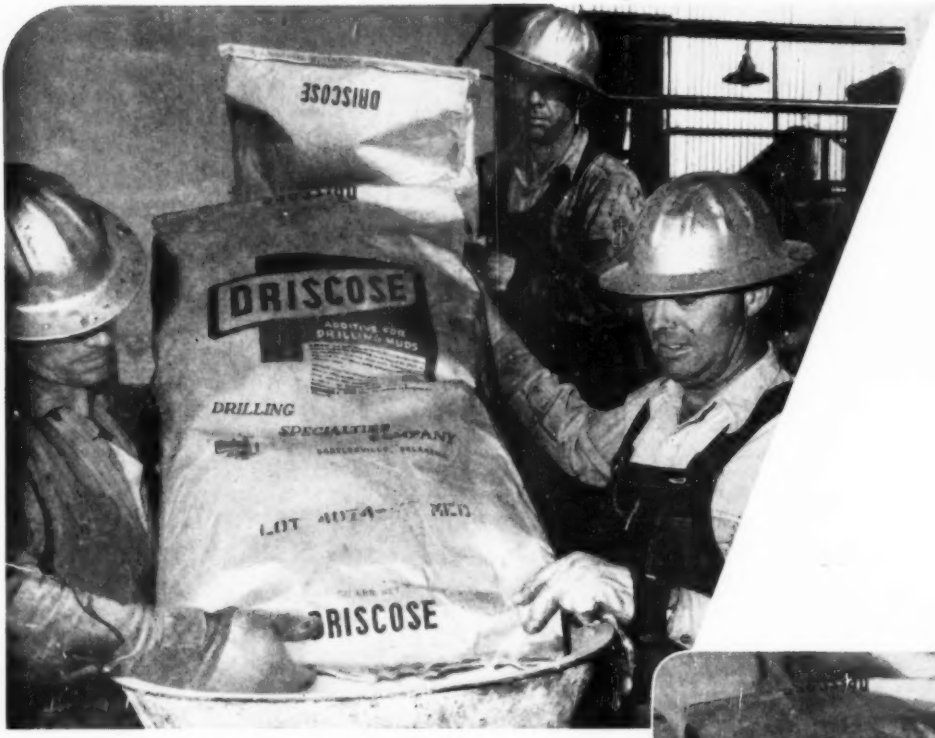
Of the 166,000,000 cu. ft. daily capacity, approximately 159,000,000 cu. ft. will be condensate and 7,000,000 cu. ft. casing-head gas. Its production capacity of more than 285,000 gal. of liquid products daily includes 150,000 gal. of motor fuel and 119,000 gal. of liquefied petroleum gas, as well as fuel oil and kerosine.

Absorbers will operate at pressures of 1,600, 800, and 200 psi. Compressor installation totals 9,000 hp. and the power plant will generate 3,000 kw. An estimated 30,000,000 cu. ft. daily of residue gas will be sold to a gas pipe-line company for transmission to consumers as fuel.

Texas Independents Seeking L.P.G. Storage Permit

Richardson & Bass, independents, Fort Worth, has applied to Texas Railroad Commission for a permit to inject liquefied petroleum gas in leases in the Keystone field of Winkler County, West Texas.

The company would store butane and propane in a 1,750-ft. horizon until market for the gas is available.



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BARTLESVILLE, OKLAHOMA

Exploration and Drilling

Louisiana's LaSalle Arch Yields Another Field

THE LaSalle arch, a regional high in east central Louisiana, has produced another discovery that looks more important after the second well, than the discovery test indicated.

North Catahoula Lake field was opened recently when Justiss-Mears 1 Harris, NW NW 2-6n-3e, was completed for 89 bbl. per day of 39° gravity oil on the pump. Now the second well, H. F. Hunt 149-F Nebo, SW SW 35-7n-3e, a north offset, has been completed with an initial potential flowing of 160 bbl. per day through a ¼-in. choke, from Wilcox (Cretaceous) perforations at 4,010-13 ft. Total depth was 4,036 ft. Flowing pressures were 185 psi. on the tubing and 650 psi. on the casing. Gas-oil ratio reported was 600 cu. ft. per bbl.

An offset well to the north of the second well, H. F. Hunt 151-F Nebo, NW SW 35-7n-3e, barring bad luck, should be testing. An attempt is being made to extend production west and south in Justiss-Mears 1 Mary Price, NW NW 8-6n-3e, and the story should soon be known there, too.

The LaSalle arch is a regional structural feature near the west side of the East Louisiana Salt basin, which in turn is an extension of the Mississippi Salt basin. The arch, with a northwest-southeast axis, has proved a very good source of Wilcox oil. Starting with Tullos-Urania on the northwest and coming southeast through Olla, Georgetown, Little Creek, Trout Creek, Nebo-Hemphill, Catahoula Lake, and with a scattering of other fields, the productive trend extends at least to Saline Lake field in the southeast corner of LaSalle Parish.

The new field fits in the narrow gap between Nebo-Hemphill field to the northwest and Catahoula Lake field on the southeast.

Details of the structural relief in the new productive area are not available. But large or small, good or bad, it indicates once more that when a trend of oil accumulation is found along some regional feature, the odds are pretty good that more accumulations will be found until eventually the trend is pretty well worked over. If conditions were regionally right for oil accumulation, and a good reservoir sand, or porous lime in some cases, is available, it doesn't require too high class a structural trap to produce oil.

The discovery was made by independents and considering the division of wildcatting activity right now, this is probably natural. With the independents drilling about 85 per cent of all wildcats, sheer numbers indicate they will make most of the successful strikes. When independents start poking wildcat holes down along a known producing trend, they are almost bound to get some hits. The big question isn't so much the percentage of hits, as the quality of the finds they are likely to get when "filling in gaps." After some good fields are found along a trend, past experience indicates the quality, on the average, of the future finds will drop off.

But then no independent wildcatter ever figures that he is going to find "an average" field. For that matter, the major-company geologists are always hoping and halfway secretly sure that their pet wildcat is going to open up something big. In the present case the comparatively shallow depth, and reasonably easy digging, combine with current prices of oil to make such ventures attractive.

Charles J. Deegan.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

LOUISIANA GULF COAST.—A new field has been opened in the northwest Welsh area, Jefferson Parish, with the completion of Continental Oil Co. 1 R. A. Estes. The well flowed 126 bbl. of 44°-gravity oil per day through 11/64-in. choke. Total depth is 11,476 ft., and production is through perforations at 11,263-67 ft. (lower Miocene sand).

TEXAS GULF COAST.—A new Yegua sand oil field is being opened in Cold Springs field, San Jacinto County, with the completion of Butcher Arthur A-3 Coline Oil Co., located in the James Rankin Survey, Abstract 40. The well flowed 5 bbl. of oil per hour through 9/64-in. choke through perforations at 4,384-88 ft.

NORTH CENTRAL TEXAS.—F. M. Manning 1-C Davis opened a new pool in east central Throckmorton County, flowing 166 bbl. of 41°-gravity oil, natural, from the Caddo lime at 4,144-50 ft.

CANADA.—Favorable showing during latest test at the Gulf-Walter Marr 1, near Pincher Creek, has given the venture further encouragement. Oil recovery at the well was 370 bbl. on a 24-hour test. Maximum gas flow rate was 8,938,000 cu. ft. daily, with tubing pressure between 2,000-3,000 psi. Gulf-Fred Shrempp 1, also near Pincher Creek, is drilling at 11,833 ft. in its search for the Madison limestone.

ROCKY MOUNTAIN AREA.—An apparent new discovery has been made at R. E. Havenstrite 2 Ryles in Oak Creek area, Routt County, Colorado. The well made 6,000 ft. of oil on 2-hour drill-stem test of the Morrison. A new discovery was made 3 miles west of Fiddler Creek field, Wyoming, at Mule Creek Oil Co.'s 1 Martin-Conley.

CALIFORNIA.—Interest is focused on Standard Oil Co. of California 5 Mushrush (Wasco field, Kern County), which operators hope will become the world's deepest producer. Water shutoff has been successfully completed, and tests are being made at the interval 15,670-90 ft. So far only gassy mud has been recovered, and if current tests are unsuccessful, operators plan to plug and test further up the hole.

MICHIGAN

Allegan and Bay Counties Get New Pool Prospects

MOUNT PLEASANT—Two possible new Traverse oil discovery wells were being tested this week. W. Spencer Cook, Inc. & H. L. Wadsworth's 1 Marshall, SW NE NE 11-1n-16w, Casco Township, Allegan County, filled and flowed 40 bbl. of oil in 50 minutes from the Traverse at a total depth of 1,187 ft. The oil pay was killed with 23 bbl. of fresh water and 5-in. casing was set at 1,154 ft. on a packer. Cleanout and tests were in progress. Traverse lime top was logged at 1,183 ft. and well was reported to be from 8-13 ft. higher on the Traverse than nearby control points. Cook, Inc. & Wadsworth control a 2,200-acre block around the wildcat. Operators indicated that additional follow-up development tests would be started immediately.

A Traverse gas-oil blowout on Don F. Rayburn's 1 Cooper-Lucht, SW SW NE 29-17n-4e, Pinconning Township wildcat, Bay County, forced abandonment of plans to carry test to the Dundee, and 5-in. casing was cemented 2,235 ft. Traverse lime top was logged at 2,107 ft. and hole was bottomed out at 2,242 ft., with oil and gas show coming in between 2,239-42 ft. The first few hours after cleanout, it flowed on an average of every 30 minutes, flowing by heads, and had produced about 40 bbl. of oil and a like amount of salt water after first 3 hours. Water was believed to be coming from the bottom of the hole and plans to plug back were announced. Rayburn's wildcat didn't appear to show much structural relief over other nearby geological control points, and if a commercial Traverse section should prove to be present, it was very likely that this well had tapped a stratigraphic trap.

Rayburn controls lease-rights to about 640 acres in the district, while Sohio Petroleum Co., Superior Oil Co., and Smith Petroleum Co. control leases in the area that might come into the play if a field is developed.

MICHIGAN WILDCAT FAILURES

Kalamazoo County, Alamo Township: Ford Oil Co. 1 Kokmeyer, Jr., NE NW SW 31-1s-12w, Traverse 1,273 ft., dry, TD 1,277 ft.

Kent County, Caledonia Township: Gortsema & Meyer 1 Finkbeiner, SW SW NE 20-5n-10w, Traverse 1,911 ft., dry, TD 1,983 ft.

Wyoming Township: Turner Petroleum Corp. 1 Grand Rapids Gravel Co., SW SW NE 16-6n-12w, Traverse, 1,793 ft., dry, TD 1,843 ft.

Oceana County, Shelby Township: Roosevelt Oil & Refining Corp. 1 Lewis, SW SE SW 31-14n-17w, Monroe 2,321 ft., dry, TD 2,358 ft.

Van Buren County, Geneva Township: W. D. Gannett 1 Kreger, SW SE SW 13-1s-16w, Traverse 1,110 ft., dry, TD 1,115 ft.

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CALIFORNIA

Kern County Test May Get World's Deepest Production

LOS ANGELES.—Standard Oil Co. of California is currently testing the 15,670-90-ft. interval in its 5 Mushrush well in Wasco field, Kern County. If production is found, this well will be the world's deepest producing well. Water shutoff was completed at 15,695 ft. First tests yielded only gassy mud, and another attempt will be made prior to plugging and testing a higher interval. Total depth is 15,866 ft. The same company's 45 Van Sicklen, 36-27s-21e, has been cleaned out. Water shutoff test is being made at 13,369 ft. and formation test is planned at 12,280 ft. This well is a wildcat in the Lost Hills area. Total depth is 14,596 ft.

At Kettleman Hills (South Dome) Standard of California is testing Miocene shows at 9,440 ft. in its 4-2 S. F. & F. L. in 12-25s-19e. Total depth is 12,054 ft.

Humble Oil & Refining Co. has spudded in two wells north and west of present Cuyama production. These are the 1 Santa Margarita Land & Cattle Co. 1, 36-32s-19e, about 5 miles northwest of Russell Ranch production, and the B-1, about 10 miles northwest of production in 9-32s-19e.

Standard has extended production in Cat Canyon field about 1,300 ft. northwest at the 64 Alexander, completed on pump for 315 bbl. of 19.20°-gravity oil per day. Total depth is 6,220 ft.

Following a flurry of leasing activity in the Costa Mesa area of Orange County, Thomas M. Blake is completing foundation for the first test well. This is the 1 Costa Mesa Community, 15-6s-10w.

L. M. Lockhart has given a small west exatnsion to Burrel field in Fresno County. Operator's 5-35 Postal Union came in at 6,668 ft. flowing 110 bbl. of 30°-gravity oil per day. Lockhart 68 Burrel in the same block, 35-16s-18e, was last reported at a depth of 6,678 ft. with no report on shows.

CALIFORNIA WILDCAT FAILURES

Fresno County, Coalinga area: Barnsdall Oil Co. 1 J. M. & R., 28-19s-16e, dry, top Kreyenhagen 7,967 ft., TD 8,006 ft., elev. 492 ft.

Kern County, Comanche Point area: Steele Petroleum Co. 1 Comanche Hills, 35-12n-18w, dry, top Santa Margarita 385 ft., soft granite 460 ft., hard granite 642 ft., TD 645 ft., elev. 1,568 ft.

Wa-Me-Co Drilling Co. 2 Cal-Wag, 36-32s-29e, dry, top Santa Margarita 1,027 ft., TD 1,041 ft., elev. 713 ft.

Tejon area: F. A. Miller 14-12 Miller-Tejon, 12-10n-19w, dry, TD 2,156 ft., elev. 1,046 ft.

Apex Petroleum Corp. 3 Los Lobos-Core, 9-10n-22w, dry, TD 3,700 ft., elev. 1,901 ft.

Temblor area: Seaboard Oil Co. 1 Anderson, 6-30s-21e, dry, top Glaucomite reef 6,067 ft., top Phacoides 6,088 ft., top first permeable sand 6,096 ft., TD 7,510 ft., elev. 2,018 ft.

SOUTHWEST TEXAS

New Pool's Second Well Is Open Hole Producer

CORPUS CHRISTI.—M. L. Massingill et al have completed their 1 J. B. Park, the second well in the new Divot field, Frio County, from open hole. The well is flowing 68 bbl. of oil per day from the Austin chalk at 5,483-5,910 ft., total depth.

J. S. & W. A. Swearingen have failed in their attempt to extend Luling field, Caldwell County, to the northwest. A light show of oil was encountered in the Edwards lime at 2,228 ft. however no shows of value were found after drilling to 2,352 ft. and operations have stopped.

A new deep sand has been discovered in Starr County with the completion of Continental Oil Co. B-120 T. B. Slick Estate, Survey 266, Abstract 968. The well flowed 110 bbl. of oil per day through 3/16-in. choke, with 1,600 psi. tubing pressure. Total depth of the well is 8,514 ft., and production is through perforations at 6,224-35 ft. from the Rincon sand.

The Atlantic Refining Co.'s 1 State Tract 230, wildcat 5½ miles southeast of Rockport in Aransas Bay, has been reported dry after drilling to 11,003 ft. Electric log was run to total depth and perforations were made at 7,504-14 ft. with no shows.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCATS

Duval County: David Lee Hill, Tr., 1 W. R. Peters est., W. A. Gavit Sur. 38, 15 mi. SW Freer, top sand 2,600 ft., TD 2,613 ft., perf. 2,600-10 ft., 670,000 cu. ft. of gas per day, ¼-in. choke, TP 520 psi., CP 530 psi.

L. O. Kelsey and Bill Fallis 1 W. H. Sling, BS&F Sur. 117, 3¼ mi. NE Seven Sisters field, top sand 3,038 ft., TD 3,233 ft., perf. 3,038-42 ft., 450,000 cu. ft. of gas per day, ⅛-in. choke, TP 1,175 psi., CP 1,175 psi.

Jim Wells County: Sinclair Prarie Oil Co. 1 A. H. Henderson, R. P. Haldeman Subd., 2½ mi. W Premont, top sand 5,335 ft., TD 6,517 ft., perf. 5,335-45 ft., 6,000,000 cu. ft. of gas per day, open flow, TP 2,100 psi.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Aransas County: The Atlantic Refining Co. 1 State Tract 230, Mud Island area, Aransas Bay, 5½ mi. SE Rockport, dry, TD 11,003 ft.

Dimmit County: St. Landry Drilling Co. 1 A. Sanches, Andrew Utz Sur. 12, A-1040, dry, TD 3,003 ft.

Duval County: Magnolia Petroleum Co. 2 Duval-State (Sec. 274), GC&SF RR Sur. 274, 9 mi. NW Freer, dry, TD 2,075 ft.

Argo Oil Corp. B-1 Joseph Gruy, Tr., J. G. Reynolds Sur. 174, 4 mi. SW Poquita Creek field, dry, TD 4,764 ft.

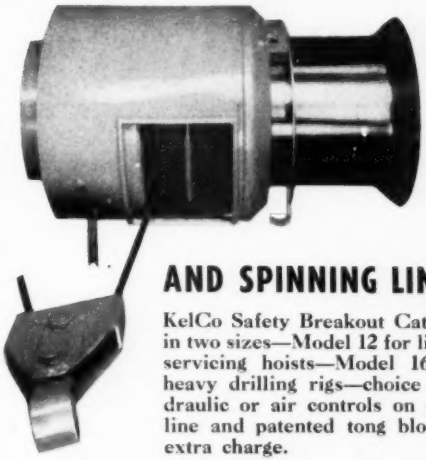
Argo Oil Corp. 1 E. T. McDowell, Jose Marcelo Hinojosa Grant, 1¾ mi. SW Sejita townsite, dry, TD 6,500 ft.

Frio County: Newman Bros. Drilling Co. and Alaska Steamship Corp. 1 Cecil Cudd, E of city of Pearsall, dry, TD 4,342 ft.

Guadalupe County: Pryor Dillard 1 Nolte est., John Sowell Sur. 16, 2 mi. SE Seguin, dry, TD 2,160 ft.

Jim Hogg County: O. W. Killam 2 Robert B. Holbein, Holbein Subd., Las Animas Grant, 11½ mi. S Bruni, dry, TD 3,042 ft.,

Trio Oil Co. 1 Angela D. de Vela et al,



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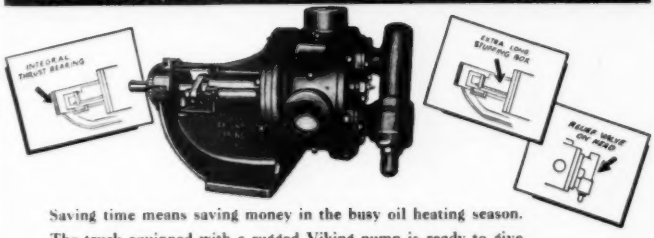

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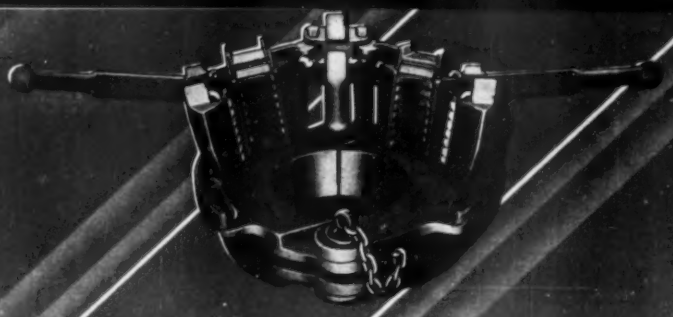

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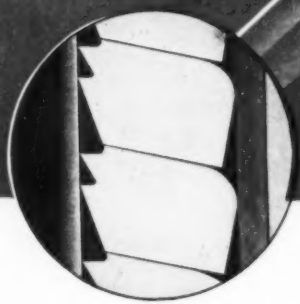

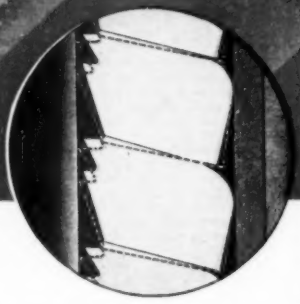

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T. R. Davis Sur. 573, 5 mi. W San Pablo field, dry, TD 3,770 ft.

Kenedy County: Humble Oil & Refining Co. C-1 John G. Kenedy, Jr., Las Barrosas Grant, 10½ mi. S Sarita, dry, TD 11,659 ft.

Milam County: Robert M. Jordan 1 E. M. Baggett et al, J. J. Acosta Sur., 10 mi. NE Rockdale, 1 mi. W Tracy, dry, TD 3,343 ft.

Webb County: Union Sulphur Co., Inc., 1 G. B. Parr, San Casimiro Grant, A-1208, near Watkins Ranch field, dry, TD 6,529 ft.

Daubert & Achning 1 S. Vasquez, Sur. 134, 3½ mi. SW Bruni, dry, TD 2,446 ft.

O. W. Killam 2 Marrs McLean, James Subd., Albercas Grant, 7 mi. SW Bruni, dry, TD 2,572 ft.

Williamson County: Denver Daugherty and P. E. Johnson 1 E. Aerni, Pedro Zarza Sur., 2 mi. N Thrall, dry, TD 890 ft.

R. L. Delp 1 Carl Lawrence, Simon Miller Sur., 16 mi. SE Taylor, dry, TD 3,100 ft.

OKLAHOMA

Pontotoc County Wildcat Flows 840 Bbl. Per Day

FLOWING at the rate of 840 bbl. of oil per day through ¾-in. choke, W. C. McBride, Inc., 1 Braley Estate, NE NW NE 9-4n-5e, northern Pontotoc County, not only opens a new pool but proves to be an unusually good well for that part of the state. Production is from what is believed to be Viola lime, topped at 1,933 ft. Casing, cemented at 2,064 ft., is perforated in the pay at 2,052-59 ft. Hole had been drilled to 3,361 ft. in the Arbuckle, topped at 3,343 ft., and then plugged back. Gravity of the oil is 36.6° A.P.I.

The well started to flow initially through casing while hole was open preparatory to running tubing. At that time, it flowed 126 bbl. the first hour, 128 bbl. the second hour, and 61 bbl. in the next half hour, after which it was shut in, and the tubing run. It is 1½ mile southeast of Bebee pool, nearest production, but on a separate local high, separated by faulting from that pool. Location has been made for 2 Braley Estate, a 10-acre location west of the discovery.

Cities Service Oil Co. 1 Dacus, C NW SW 29-5n-4w, deep wildcat test 2½ miles west of North Lindsay field, McClain County, which on previously reported drill-stem tests had given indications of opening another important new producing area, flowed 109 bbl. of pipe-line oil on a 24-hour completion gage through ½-in. choke. Total depth is 11,748 ft. with 7-in. casing at 11,180 ft. in the first Bromide sand, topped at 11,159 ft. Open hole tested takes in not only the first Bromide sand, but also the second and basal Bromides and the McLish, topped at 11,613 ft.

A mile north of North Hoover pool, Garvin County, Stanolind Oil & Gas Co. 1 Richardson Unit, SW SE NE 1-1n-1w, has been completed flowing 72 bbl. of clean oil in 24 hours through ¼-in. choke from casing perforations at 4,573-89 ft. in sand topped at 4,528 ft. Hole had been drilled to 4,664 ft. and plugged back to 4,593 ft.

A new pay zone has been established in the rapidly developing new South Palacine pool in Stephens County with the completion by Sunray Oil Corp. of its 4 Nichols, SE NW NE 21-2S-6w. The well flowed 12.3 bbl. hourly through 18-64-in. choke from open hole at 2,625-52 ft. Although in the Arbuckle detrital, from which other wells are producing, the zone is slightly deeper than the regular pay. The latter zone also yielded another producer the past week at Amerada Petroleum Corp. 4 Yates SW NW SE 16-2s-6w, which swabbed 19 bbl. in 7 hours from open hole at 2,617-20 ft.

OKLAHOMA SUCCESSFUL WILDCAT

Garvin County: New pay in Katie field—Carter Oil Co. 1 Cottrell-Moss, C NE NW 8-1n-1w, flowed 266 bbl. of oil per day from second Deese sand at 5,390-5,418 ft., TD 6,455 ft.

OKLAHOMA WILDCAT FAILURES

Carter County: Blaylock 1 Majors, NW NE NW 27-1s-2w, dry, TD 2,686 ft. in Sylvan, basal Pontotoc-Springer 185 ft., Caney 815 ft., Sycamore 1,463 ft., Woodford 1,872 ft., Hunton 2,222 ft.

Cotton County: Mosley 1 Watson, NW SW SE 11-3s-11w, dry, TD 1,815 ft., sand 1,371 ft., 1,527 ft., 1,646 ft., 1,709 ft., and 1,728 ft.

Jefferson County: Massad 1 Featherston, NE NE SE 21-3s-5w, dry, TD 1,218 ft. Wilcox 1 Stone, NE NE SW 30-4s-7w, dry, TD 2,010 ft., sand 1,340 ft., 1,512 ft., 1,730 ft., 1,875 ft., and 1,963 ft., no shows.

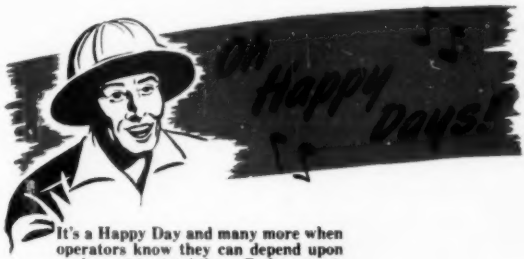
Noble County: Mazda 1 Jewell, SE SE SW 23-22n-2w, dry, TD 5,172 ft., Oswego 4,354 ft., Mississippi lime 4,807 ft., Woodford 4,955 ft., Viola 4,993 ft., Wilcox 5,066 ft., second Wilcox 5,148 ft.

Okfuskee County: Davidson et al 1 Hicks, NW NE NW 30-12n-10e, dry, TD 2,192 ft.

Payne County: Berry et al 1 Barker, NE NW NW 11-18n-4e, dry, TD 3,940 ft., Big lime 3,172 ft., Oswego 3,218 ft., Prue 3,312 ft., Verdigris 3,356 ft., lower Skinner 3,460 ft., lime 3,494 ft., Mississippi lime 3,761 ft., Woodford 3,880 ft., Misener 3,915 ft., Sylvan 3,920 ft.

Seminole County: Deardorf 1 Thompson, NE NW SE 15-11n-8e, dry, TD 3,581 ft., lime 3,120 ft., Booch 3,272 ft., Gilcrease 3,465 ft., Cromwell 3,572 ft.

Stephens County: Atkinson 1 Walker, SE SE NE 20-2s-6w, dry, TD 2,901 ft., shaly sand 1,450 ft., conglomerate sand 1,500



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APPALACHIAN FIELD

'Grassroot' Producers Highlight Operations

PITTSBURGH.—Two good shallow sand wells were reported in Gilmer County: in Center district, West Virginia Production Co. 1 Goff & Moore, an old well drilled deeper, resulted in 20 bbl. of oil per day from the Big Injun with a flow of gas gaging 1,000,000 cu. ft., total depth 1,912 ft.; in DeKalb district, Hope Natural Gas Co. 9360 L. M. Law gaged 1,166,000 cu. ft. of gas from the Berea sand, total depth 2,137 ft. A successful deep wildcat in Steel district, Wood County, added to the producers completed during the week.

In southwest Pennsylvania, Georges Township, Fayette County, William E. Snee et al are building rig at their 1 N. E. Murphy, and in Wharton Township, are drilling their 3 Indian Creek Coal & Coke Co. (elevation 2,615 ft.) at 3,679 ft.

WEST VIRGINIA SUCCESSFUL WILDCAT

Wood County, Steele district: Columbian Carbon Co. 1-1124 C. W. Moore, elev. 772 ft., 1,220,000 cu. ft. of gas, Corniferous lime 4,767 ft., Oriskany sand 4,884 ft., gas 4,885-4,908 ft., TD 4,964 ft.

WEST VIRGINIA WILDCAT FAILURE

Ritchie County, Grant district: Davis-Kelly Oil Co. 1 Morello Jackson, elev. 633 ft., dry, Corniferous lime 5,322 ft., Oriskany sand 5,516-5,609 ft., salt water 5,525 ft., TD 5,616 ft.

MISSISSIPPI

Wildcat Runs High On Chalk Top

JACKSON.—L. M. Lockhart has encountered top of chalk by samples at 8,905-20 ft. in his 1 U.S.A., wildcat in 26-6n-4e, Franklin County, Mississippi. Based on remote subsurface control, this point seems to be higher than normal. Top of chalk in three wells approximately 12 miles north, northeast, and east from the well ranges from 8,362 ft., 8,160 ft., and 8,088 ft., and subsurface mapping is based on control from these wells.

The Carter Oil Co. is now considering bids for contract to drill a lower Cretaceous test in Smith County, Mississippi. Negotiations have been completed for the well to be drilled in 11-10n-14w, and location has been cleared.

H. G. Lewis, Jr., has consummated a deal with Big Chief Drilling Co. to drill a lower Cretaceous test in 35-8n-2e, Jefferson County, Mississippi. Big Chief will fulfill the drilling obligation.

Sun Oil Co. has announced location for its 1 Ruth M. Biship, wildcat in 10-4s-17e, Columbia County, Florida, and is moving in material for immediate drilling. This well will probably complete drilling in Florida for Sun.

MISSISSIPPI WILDCAT FAILURE

Sharkey County: Clyde Creighton 1 Castle, 31-14n-5w, dry, TD 3,884 ft.

FLORIDA WILDCAT FAILURE

Suwanee County: Sun Oil Co. 1 A B Russell, 8-5s-15e, dry, TD 3,139 ft.

ALABAMA WILDCAT FAILURES

Clarke County: A. R. Temple 1 Scotch Lumber Co. 1-9n-1e, dry, TD 5,003 ft. Washington County: Humble Oil & Refining Co. 1 C. E. Harrel, 41-5n-2e, dry, TD 8,505 ft.

LA.-ARK.

La Salle Parish Wildcat Finds Midway Zone Dry

SHREVEPORT. — Justiss - Mears 1 Mary Price, NW NW 8-6n-3e, La Salle Parish wildcat, is dry at 5,336 ft. in the Midway section after cores gave no shows except at 1,400 ft. in Cockfield.

Union Production Co. 1 Section 13 "Unit," 13-17n-12w, Cotton Valley test in Sligo field, Bossier Parish, took a drill-stem test in the Rodessa through perforations from 4,144-4,210 ft., tool open 16 minutes, and recovered 135 ft. of slightly gas-cut mud. Operator is drilling below 5,150 ft. in the Lower Glen Rose.

In Union County, Arkansas, Lion Oil Co. 1 Loftin, 34-18s-18w, took cores from 8,265-8,308 ft., 8,347-96 ft., and 8,3936-8,440 ft. and recovered red sand and shale with streaks of anhydrite but no shows. Don D. Montgomery 1 J. K. Mahony, 25-17s-18w, 2 miles southeast of Mount Holly field, is dry at 7,631 ft. in the Smackover. Walter Lown et al 1 W. E. Baker, 22-16s-14w, with total depth of 5,689 ft. in the Smackover, ran electrical survey to 5,681 ft. Operators say there was a slight show of oil in the Meekin and Smackover sections.

Quad Drilling Co. 1 Crossett Lumber, 23-13s-6w, Drew County, is dry at 4,192 ft. in the Tokio topped at 3,998 ft.

ARKANSAS WILDCAT FAILURE

Union County: R. H. Crow, Tr., and The

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Dorsett Co. 201 Union Sawmill, 2-18s-14w, dry, TD 4,010 ft., elev. 258 ft.

NORTH LOUISIANA WILDCAT FAILURE

Union Parish: Sam Sklar Oil Co. et al 1 L. Sawyer, 1-23n-3w, dry, TD 2,350 ft.

TEXAS GULF COAST

Deep Test Sets Casing, Drills Toward 12,500 Ft.

HOUSTON—Seven-inch casing has been set in Stanolind Oil & Gas Co.'s et al wildcat in the Gulf of Mexico off Galveston Island, Galveston County. Protection pipe was set at 10,973 ft. and operators are now drilling ahead to the projected depth of 12,500 ft.

Houston Oil Co. is drilling ahead below 9,270 ft. on a deep test projected to 11,000 ft. in its A-1 B. W. Trull et al, wildcat approximately ¾ mile east of Francitas field, Jackson County. On drill-stem test at 7,951-61 ft., the well recovered 1,150 ft. of oil and 120 ft. of salt water through ¼-in. and ¾-in. chokes.

An extension to Speaks field, as well as a new pay discovery, has been completed at Fidelity Royalty Co. 1 Kittie Clark. The well was completed through perforations at 5,273-78 ft. as a gas well and shut in for outlet. Shut-in pressure is 1,975 psi. and casing pressure is 2,005 psi. The new discovery is located ⅝ mile south-southeast of the 1 E. P. Zoch et al, a southwest extension to the field.

C. C. Gilger has announced plans to drill a confirmation test to his 1 J. W. Prasifka oil discovery in the George Schley Survey, Wharton County. The new well is 740 ft. south of the 1 Prasifka, approximately 2 miles south of Lane City, and projected depth is 6,000 ft.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Brazoria County: McCarthy Oil & Gas Corp. 1 R. F. Willy, C. Smith League, 4 mi. SW Angleton, top sand 9,182 ft., TD 12,220 ft., perf. 9,182-90 ft., 322 bbl. oil per day, 13/64-in. choke, GOR 551, TP 800 psi., 33.1° gravity, dual completion, top sand 9,850 ft., perf. 9,852-56 ft., flowed ungaged gas.

Jefferson County: McCarthy Oil & Gas Corp. 1 Rev. C. E. Byrne, North Big Hill area, T&NO Sec. 147, 5 mi. SE Hamshire, top sand 8,107 ft., TD 10,536 ft., perf. 6,108-24 ft., 122,000,000 cu. ft. of gas per day open flow, SIP 3,121 psi.

Liberty County: L. M. Josey et al 1 A. W. Abshire et al, M. G. White League, top sand 6,800 ft., TD 8,037 ft., perf. 6,802-08 ft., 188 bbl. oil per day, 7/64-in. choke TP 1,850 psi., 36.6° gravity.

New pay at NW Hull Flank—John W. Mecom 1 State of Texas, W. L. Thomas Sur., top sand 7,676 ft., TD 9,214 ft., per. 7,676-96 ft., 176 bbl. oil per day, 3/16-in. choke, GOR 1,137, TP 825 psi., CP 1,150 psi., 38.5° gravity.

Wharton County: R. J. Caraway 1 F. E. Appling, Wm. Vess Sur., top sand 5,243 ft., TD 5,327 ft., perf. 5,243-45 ft., 6,000 cu. ft. gas per day, ¼-in. choke, TP 1,380 psi., SIP 3,000 psi.

C. C. Gilger 1 J. W. Prasifka, GWT&P Sur., A-625, top sand 5,548 ft., TD 5,621 ft., perf. 5,548-54 ft., 175 bbl. oil per day, 5 32-in. choke, GOR 600, TP 610 psi., 24.9° gravity.

Gulf Oil Corp. 1 J. H. H. Dennie, Robert Kuykendall League, A-39, 2¾ mi. W Wharton, TD 5,376 ft., perf. 5,300 sand, 9,300,000 cu. ft. of gas per day open flow, 1,850 psi.

The Texas Co. 1 Mrs. Louise Hutchins et al, James Tumlinson Sur., 1¾ mi. SE Wharton, top sand 4,666 ft., TD 6,350 ft., perf. 4,666-73 ft., ungaged gas, ¼-in. choke, TP 1,820 psi.

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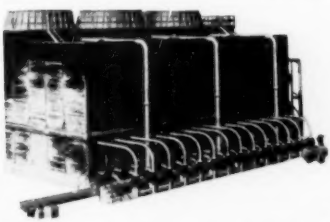

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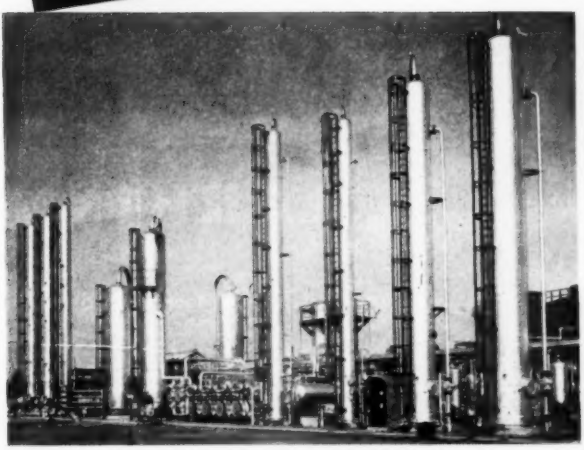

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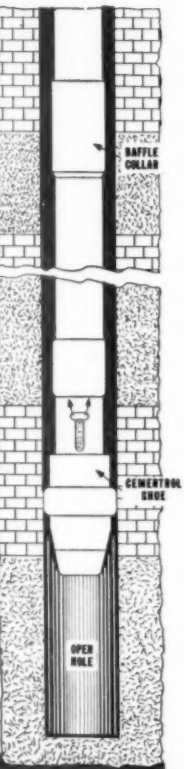

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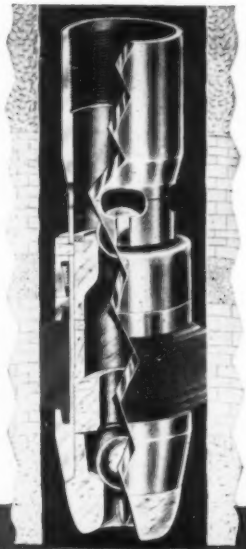

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TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Brazoria County: R. A. Irwin and J. R. Buck 1 Ramsey State Prison Farm, S. Richardson League, 3 mi. SW Ramsey State Prison Farm, dry, TD 9,510 ft.

Chambers County: Humble Oil & Refining Co. C-18 Galveston Bay State, Sec. A-8 Galveston Bay, dry, TD 8,999 ft.

R. A. Irwin and J. R. Buck 1 J. R. Barber, James Lawrence Sur., approximately $2^1/_2$ mi. NE Cotton Lake production, dry, TD 8,015 ft.

Fort Bend County: Jack W. Frazier 1 H. B. McCrary et al, Clodine area, James Perry Sur., A-299, 5 mi. SW Codine, dry, TD 7,612 ft.

Karnes County: Geo. W. Graham 1 M. E. Wolters et al, Albert Mimms Sur., A-385, 1 mi. NE Porter field, dry, TD 7,830 ft.

Liberty County: Alfred G. Glassell, Jr., and Dillard-Waltermire, Inc., 1 W. H. McFaddin et al, at Moss Bluff, James McFaddin Sur., A-76, 12 mi. S Liberty, dry, TD 9,002 ft.

Live Oak County: W. E. Fox Trustee and Wood Oil Co. 1 W. C. Weaver, 8 mi. NE George West, dry, TD 4,265 ft.

Victoria County: Taylor Refining Co. 1 C. L. Brandes, $1^1/_2$ mi. SE Telferner, Samuel Wells Sur., A-349, dry, TD 5,559 ft.

N. CENTRAL TEXAS

New Gentry Field Gets Confirmation

WICHITA FALLS.—A confirmation well in the Gentry Mississippi lime pool of southeastern Throckmorton County has been completed by James H. Snowden et al 1 Dickie, Block 685, TE&L Survey, $^1/_2$ mile south of Woodson. Production was over 135 bbl. of 40.2°-gravity oil in 5 hours, natural, through open hole with pay from 4,540-46 ft., total depth.

Standard Oil Co. of Texas opened another Strawn sand pool in northern Grayson County with completion of 1 Beth Brown, H. C. Atkinson Survey, $^1/_2$ mile east of Sherman. It pumped 193 bbl. of 30°-gravity oil daily through perforations from 3,398-3,434 ft. The discovery is considered on a separate structure from Sherman pool.

Tom Medders and Huff 1 W. C. Williams, H. Hadden Survey, opens Caddo lime oil pay for Hundley pool of southern Montague County. On a 45-minute drill-stem test, there was gas to the surface in $4^1/_2$ minutes and oil in 29 minutes.

Snuggs & Neal, Inc., 2 G. A. LeMaster, Block 2, League 2, University Land Survey, wildcat 10 miles northeast of Gainesville, Cooke County, was being swabbed down after drilling plug from casing cemented at 2,747 ft. The wildcat showed for possible commercial production on drill-stem test of the Strawn from 2,748-54 ft. Recovery was 800 ft. of free oil.

Hanlon-Boyle, Inc., et al 1 H. R. Tarr, wildcat in the J. W. Williams Survey A-877, 7 miles south of Antelope, Jack County, topped the Caddo at 4,520 ft. and 1-hour drill-stem test of the section at 4,520-67 ft. recovered 90 ft. of free oil and 250 ft. of heavily oil-cut mud.

American Liberty Oil Co. 1 J. S. Criswell, wildcat in Section 97, T&NO Survey, 8 miles south of Seymour in south central Baylor County, has been completed through perforations from 5,162-72 ft. after being treated with 14,500 gal. of acid. It pumped 15 bbl. of 44°-gravity oil per day.

NORTH CENTRAL TEXAS (DISTRICTS 7-B & 9) SUCCESSFUL WILDCATS

Archer County: Dub-Wood Drlg. Co. 1 J. J. Hrncirik, Sec. 1, EL&BB Sur. A-688, 6 mi. N Megargel, pumped 6 bbl. of oil a day, top pay 1,397 ft., TD 1,500 ft., elev. 1,162 ft.

Henry Grace Prod. Co. 2 Bertha Coffett, Blk. 99, Harris Subd. of Club Ranch, 5 mi. W Archer City, pumped 25 bbl. of oil a day, top pay 1,138 ft., TD 1,143 ft., elev. 1,243 ft.

G. E. Kadane & Sons 2 J. M. Bloodworth "A" Blk. 7, Geo. Bruner Sur., A-8, 2 mi. W Scotland, pumped 15 bbl. of 38°-gravity oil a day, GOR 225-1, top pay 1,306 ft., TD 4,731 ft.

Callahan County: Star Oil Co. 2 Mrs. C. Smith, D&DA Sur., 3 mi. E Admiral, pumped 61 bbl. of 40°-gravity oil a day, top pay 1,964 ft., TD 1,967 ft., elev. 1,818 ft.

Coleman County: Coe Oil Co. 5 John W. Harris, Blk. 10, John Sanders Sur. 162, 3 mi. N Burkett, pumped 3 bbl. of 34°-gravity oil a day, top pay 369 ft., TD 375 ft., elev. 1,703 ft.

Jack County: Mid-Continent 2 J. F. Boyd "A," S. H. Hazel Sur. A-258, 3 mi. S Post Oak, flowed 533 bbl. of 45°-gravity oil a day, 26/64-in. choke, GOR 741-1, pay 6,293-6,342 ft., Ellenburger 6,180 ft., TD 6,342 ft.

Shackelford County: Hedrick Oil Co. 3 Chloe A. Nail, Sec. 120, ETRR Sur., 13 mi. NW Albany, pumped 10 bbl. of 35°-gravity oil a day, GOR 1200-1, TP 100 psi., CP 300 psi., top pay 1,346 ft., TD 1,369 ft.

Humble 1 F. G. Coates, Tr., "B," Sec. 26, Blk. 14, T&P Sur., $7^1/_2$ mi. SE Nugent, pumped 36 bbl. of 37°-gravity oil a day, top pay 1,609 ft., TD 1,731 ft., elev. 1,737 ft.

Wilbarger County: Frank Wood 1 W. T. Waggoner "R," Sec. 14, Blk. 13, H&TC Sur., $3^1/_2$ mi. W Electra, pumped 27 bbl. of 40°-gravity oil a day, GOR 400-1, top pay 1,939 ft., TD 2,344 ft., elev. 1,185 ft.

NORTH CENTRAL TEXAS (DISTRICTS 7-B & 9) WILDCAT FAILURES

Baylor County: S. F. Hutcheson 2 H. N. Brown, Sec. 49, Blk. 45, H&TC Sur., 3 mi. SW Bomarton, dry, TD 1,552 ft.

Brown County: Horace E. White et al 1 Brownwood Country Club, Blk. 34, Kerr CSL Sur., dry, TD 1,785 ft., Hanger 1,550 ft.

Childress County: Garden Valley Oil Co. 1 Ben McKeever, Sec. 428, Blk. H, W&NW Sur., 7 mi. N Kirkland, dry, TD 2,480 ft.

Clay County: Continental Oil Co. 1-A W. P. Ferguson, T. Plemons Sur., $2^1/_2$ mi. N Jolly, dry, TD 6,505 ft., Ellenburger 6,258 ft.

Haroldson L. Hunt, Jr., Tr. Est. 1 Fred Keen, Sec. 2698, TE&L Sur., A-528, $3^1/_2$ mi. N Shannon, dry, TD 4,802 ft.

Cooke County: Harvey Drlg. Co. and Kay Kimbell, Hiram Walker Sur. A-1082, $3^1/_2$ mi. NW Burns City, dry, TD 2,631 ft.

Kimbell & Harvey 1 G. M. Smith, J. Boyle Sur. A-88, 4 mi. NE Gainesville, dry, TD 4,378 ft., Ellenburger 4,280 ft.

Eastland County: T. C. Beard & Paul Walker 1 Mrs. R. B. Armstrong, D. H. Yeiser Sur. 753, $3^1/_4$ mi. NW Pioneer, dry, TD 341 ft.

Fisher County: Drilling & Exploration 1 J. A. Rowland, Subd. 3-A, R. H. Hibbitt Sur. 331, $2^1/_2$ mi. NW Sylvester, dry, TD 5,025 ft., elev. 1,860 ft.

Haskell County: Humble 1 Laura F. Williams et al, Sec. 3, GH&H Sur. A-152, $13^1/_2$ mi. SE Haskell, dry, TD 5,402 ft., Caddo 4,845 ft., Mississippian 5,048 ft., Ellenburger 5,250 ft., elev. 1,599 ft.

Jones County: S. C. Herring Drlg. Co. 1 O. L. Henry, Sec. 116, Blk. 1, BBB&C Sur., 10 mi. W Stamford, dry, TD 5,002 ft., Canyon 3,970 ft.

Herring 1 Lula Stephens, Lge. 337, McMullen & McGlain Sur., 5 mi. SE Hamlin, dry, TD 3,412 ft., elev. 1,762 ft.

Herring 1 J. F. Walker, Sec. 51, Blk. 1, BBB&C Sur., 10 mi. W Stamford, dry, TD 3,220 ft., elev. 1,635 ft.

Nolan County: Sweetwater Exploration 1 Mrs. W. W. Davis, Sec. 165, Blk. 1-A, H&TC Sur., 7 mi. E Mary Neal, dry, TD 6,723 ft., reef 5,546 ft., Ellenburger 6,580 ft., elev. 2,366 ft.

Shackelford County: Jack H. Moore 1-B Dawson & Conway, Sec. 185, ETRR Sur., 7 mi. E Lueders, dry, TD 1,608 ft.

Taylor County: Geochemical Surveys 1 A. H. Rigsby, Sec. 36, Lunatic Asylum Lands, 8 mi. SE Abilene, dry, TD 4,070 ft., elev. 1,848 ft.

Wichita County: K. D. Harmon 1 Kiesling, Richard Brown Sur. A-517, 4 mi. N Iowa Park, dry, TD 2,000 ft.

Frank Wood 1 Ferd Keller, Blk. 268, Waggoner Col. Subd., 4 mi. NE Electra, dry, TD 2,205 ft., elev. 1,155 ft.

Wilbarger County: Frank Wood 1 W. T. Waggoner "R," Sec. 4, Blk. 13, H&TC Sur., $2^1/_2$ mi. SW Electra, dry, TD 2,460 ft.

Young County: Woods Drlg. Co. and Cox Drlg. Co. 1 W. G. Mobley, Sec. 2701, TE&L Sur., 3 mi. E Loving, dry, TD 5,474 ft., Barnett 5,190 ft., Chappell 5,232 ft., Ellenburger 5,375 ft.

KANSAS

Barton County Discovery Rates Maximum Potential

ESTABLISHING a new producing area 2 miles east of Ames pool in eastern Barton County and about the same distance southwest of Gemeinhardt pool in western Rice County, El Dorado Refining Co. and Flourney & Williams Drilling Co. 1-B Stumps, NW NW SE 24-18-11 (Barton County), has been completed with an Echometer potential of 3,000 bbl. per day (maximum) from Arbuckle lime, topped at 3,283 ft. (—1,511 ft.). Production is from open hole at 3,285-99 ft.

Ferrell Drilling Co. 1 Hahn, NW NW SW 10-22-13, completed as the discovery well of Silver Bell pool, Stafford County, made a pumping potential of 408 bbl. per day after a 500-gal. acid treatment in the Arbuckle at 3,773-86 ft. (—1,876-89 ft.). It is about a mile northwest of Kenilworth pool.

Stafford County has another new pool with the completion of Westgate-Greenland Oil Co. 1 Grow, SW SW SE 16-21-13, which pumped 132 bbl. per day on potential test. Production is from the Arbuckle at 3,705-12 ft. (—1,813-20 ft.). Although only $^1/_2$ mile north of Hazel pool, it is separated from that pool by a dry hole, and has been designated officially as Grow pool.

Finston & Co. and Murfin Drilling Co. apparently are opening another Lansing pool in their 1 Sims, NW NW NW 9-19-6, Rice County, which, in a drill-stem test at 3,075-97 ft., got a good gas show and recovered 110 ft. of clean oil. Lansing was topped at 2,768 ft. (—1,139 ft.). Casing has been cemented through the pay to 3,110 ft. Nearest production is Smyres pool, 6 miles southeast.

Two additional wildcats in Barber County are showing for production from the Mississippi lime, one a gas well and the other a possible oil producer. Barbara Oil Co. 1 Page, SW SW SW 15-33-11, 7 miles east of Boggs pool, nearest production, and 11 miles north of the Oklahoma line, recovered 260 ft. of oil and gas-cut mud in a drill-stem test at 4,545-65 ft. Mississippian was topped at 4,475 ft. (—3,040 ft.). Aladdin Petroleum Corp. et al 1 Kincaid, SW NE NW 15-34-14, same county, topped the Mississippian at 4,815 ft. (—3,121 ft.), and, in a drill-stem test at 4,818-53 ft., showed gas in 5 minutes, flowing at an estimated rate of 250,000 cu. ft. per day, and recovered 215 ft. of gas-cut mud. It is 3 miles east of Aetna gas pool, 5 miles southwest of Medicine Lodge gas pool, and 7 miles north of the Oklahoma line.

KANSAS WILDCAT FAILURES

Barber County: Woods Drilling Co. 1 Schupbach, C N/2 NW NW 15-34s-11w, dry, TD 5,195 ft., Elgin sand 3,442 ft., Douglas 3,650 ft., Kansas City 4,120 ft., Chattanooga 4,835 ft., Misener 4,863 ft., Maquoketa 4,865 ft., Viola 4,882 ft., Simpson shale 4,979 ft., Simpson sand 4,994 ft., Arbuckle 5,170 ft.

Barton County :The Texas Co. 1 Hoffmeister, SW SW NE 16-17s-12w, dry, TD

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One of these grades of HASTELLOY Alloy may be what you require

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Excellent Resistance To:	hydrochloric and sulphuric acid	boiling hydrochloric acid and wet hydrochloric acid gas	free chlorine, acid solutions of ferric and cupric salts, and sulphuric acid	sulphuric acid of all concentrations up to the boiling point
Good Resistance to:	phosphoric, acetic, formic, and other organic acids	sulphuric acid	hydrochloric and nitric acid	phosphoric acid
Available Forms:	castings, forgings hot-rolled bars, strip, plate, sheet, rods, wire, welded tubing	castings, forgings, hot-rolled bars, strip, plate sheet, rods, wire, welded tubing, cast or drawn welding rods	castings, plate, sheet, welded tubing, cast welding rods	castings, cast welding rods

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3,430 ft., anhydrite 763 ft., Topeka 2,765 ft., Heebner 3,010 ft., Toronto 3,028 ft., lime 3,103 ft., Lansing 3,120 ft., conglomerate 3,366 ft., Arbuckle 3,380 ft.

Ellis County: J. M. Huber Oil Co. and Prime Drilling Co. 1 McCouley, SW NW NE 4-11s-19w, dry, TD 3,697 ft., anhydrite 1,445 ft., Topeka 3,071 ft., Heebner 3,289 ft., Toronto 3,311 ft., Lansing 3,335 ft., basal Kansas City 3,544 ft., Marmaton 3,574 ft., conglomerate 3,600 ft., Simpson 3,625 ft., Arbuckle 3,647 ft.

Lyon County: White & Ellis 1 Smith, SE SW SW 17-21s-12e, dry, TD 1,947 ft., Bartlesville 1,910 ft.

McPherson County: Hall & Prather 1 Ediger, SE SE NE 20-21s-5w, dry, TD 4,016 ft., Topeka 2,415 ft., Lansing 2,825 ft., Kansas City 2,900 ft., Mississippian 3,398 ft., Kinderhook 3,648 ft., Viola 3,906 ft., Simpson 3,936 ft., Arbuckle 4,007 ft.

Rice County: Anderson-Prichard Oil Corp. 1 Buss "B," NW SW SE 25-18s-10w, dry, TD 3,285 ft., Heebner 2,755 ft., lime 2,876 ft., Lansing 2,900 ft., Arbuckle 3,259 ft.

Pabco and Jones-Sheilburne 1 Burdick, NE NE SW 15-21s-6w, dry, TD 3,546 ft., Heebner 2,712 ft., lime 2,886 ft., Lansing 2,916 ft., Mississippian 3,506 ft.

Sumner County: Atlantic Refining Co. 1 Marshall, SE SE NW 5-33s-3w, dry, TD 4,557 ft., lime 2,996 ft., Stalnaker 3,013 ft., Kansas City 3,308 ft., Mississippian 3,975 ft., Simpson 4,386 ft., Arbuckle 4,508 ft.

Woodson County: R. R. Murray 1 Kimball, SW SW NW 21-24s-14e, dry, TD 1,740 ft., Mississippian 1,690 ft.

CANADIAN FIELDS

Canadian Gulf Oil Co. Stakes Stettler Follow-up

CALGARY.—Canadian Gulf Oil Co. has commenced operation at its first follow up well near the company's Stettler oil discovery made 2½ months ago. The new venture, Gulf E. Bauer 1, is situated in LSD 4, 34-37-20w4, about 2 miles south of the Ellis discovery and 1 mile southwest of Gulf Jerard 1, dry hole, around 100 miles northeast of Calgary. Crew is currently clearing site and rigging up.

Barrhead.—Stanolind Oil & Gas Co. ran a series of production tests at the Barrhead 1, wildcat oil strike, obtaining oil with sizable quantities of water. The well, LSD 15, 10-58-5w5, about 57 miles northwest of Edmonton, was drilled to 6,414 ft. and then plugged back to the Madison at 4,036 ft. prior to running production string of casing. During testing, the well made 2,387 bbl. of 23°-gravity oil plus 1,694 bbl. of water. Gas flow, during test period of 20 days, was measured at 2,000,000 cu. ft. daily. The well is temporarily shut in.

Irma.—Imperial Oil, Ltd., has started drilling at a wildcat about 180 miles northeast of Calgary, in the southern portion of the huge Viking-Kinsella gas field. Its Irma 1 is staked in LSD 6, 14-46-9w4, about 4 miles northeast of the town of Irma.

Whitemud.—A group of eastern Canadian interests has started moving in equipment to site for a second test on acreage held in the Whitemud region. The group: New Pacalta Oils, Ltd., Chief Redwater Oils, Ltd., Freehold Oil Corp., Ltd., Granleduc Oils, Ltd., and the George Richardson Trust, obtained its first production at Whitemud slightly over a month ago at a well drilled ¾ mile southwest of Imperial's Lower Cretaceous oil discovery. The new site, New Pacalta-Whitemud 2, is located in LSD 16, 15-51-25w4, ¼ mile north of the initial success.

WESTERN CANADA WILDCAT FAILURES

Long Island-Birch Lake 1, LSD 2, 30-51-10w4, TD 3,234 ft.

Fortune-Roxana-Chisholm 1, LSD 15, 23-68-1w5, TD 3,653 ft.

Stanolind-Rochester 1, LSD 7, 11-62-23w4, TD 4,469 ft.

Texaco-McColl-Spotted Creek 2, LSD 3, 35-42-23w4, TD 6,550 ft.

Imperial-Sprucefield 1, LSD 1, 31-60-19w4, TD 3,561 ft.

EASTERN CANADA

KIMBALL.—The largest gas well drilled in Ontario in 15 years has been completed by Imperial Oil on the Roy W. Booth farm, Lot 21, Concession 7, Moore Township, 1½ miles northwest Kimball gas field. The flow, from the Guelph-Niagara formation, is estimated at 15,000,000 cu. ft. of dry gas a day, with around 800 psi. rock pressure. After throwing the tools out of the hole and knocking off the control head, the gas blew wild for nearly 7 hours. Union Gas Co. of Chatham recently laid 10 miles of 8-in. line to take production from Kimball field, which was developed a couple of years ago.

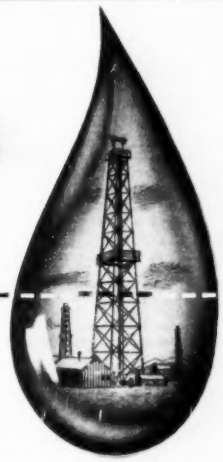
SOUTH LOUISIANA

New Deep Condensate Pool Found in Iberville Parish

NEW ORLEANS.—Callery & Hurt have opened a new condensate pool with the completion of their 1 Repp, wildcat in 79-9s-11e, Iberville Parish. The well flowed 414 bbl. of 51.4°-gravity oil plus 1,725,000 cu. ft. of gas per day through 5/32-in. choke with 325 psi. pressure on the tubing and casing pressure at 3,362 ft. Total depth of the well is 11,300 ft., with 5½-in. string at 11,265 ft. Production is through perforations at 10,890-27 ft.

A new sand in Iowa field Calcasieu Parish, has been discovered by Magnolia Petroleum Co. 1 Bowman, which is flowing

CANADA'S OIL FIELDS



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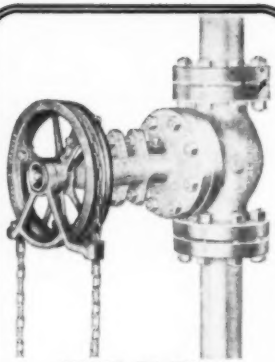

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110 bbl. of 45.1°-gravity oil per day through a 10/64-in. choke with 6,450 psi. tubing pressure. The well was drilled to total depth of 11,800 ft. and is producing through perforations at 10,202-07 ft.

Union Producing Co. has logged 19 ft. of saturated sand in the Wilcox (around 5,600 ft.) in its 1 Hudson, wildcat 1 mile north of Big Island production, 11-4n-3e, Rapides Parish. Projected depth of the hole is 10,500 ft., and operators are now drilling around 5,900 ft.

Sid Richardson is drilling ahead in his 1 C. R. & H. A. Houssiere, wildcat test 1½ miles west of Indian Village, Jefferson Davis Parish, after testing gas and salt water through perforations at 8,234-48 ft. After testing, the operator squeezed off these perforations and is drilling ahead.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Calcasieu Parish: New pay at Iowa—Magnolia Petroleum Co. 1 Bowman, 12-9s-7w, top sand 10,212 ft., TD 11,800 ft., perf. 10,202-07 ft., 110 bbl. oil per day, 10/64-in. choke, GOR 34,275, TP 6,450 psi., 45.0° gravity.

Iberville Parish: Callery & Hurt & Phillips Petroleum Co. 1 Repp, 79-9s-11e, top sand 10,890 ft., TD 11,300 ft., perf. 10,890-27 ft., 414 bbl. distillate per day, 5/32-in. choke, TP 325 psi., CP 3,362 psi., 51.4° gravity.

Terrebonne Parish: Kerr-McGee Oil Industries, Inc., 1 State Lease 750, Block 28, in Ship Shoal area, approximately 7½ miles offshore, top sand 8,482 ft., TD 13,975 ft., perf. 8,482-90 ft., 69 bbl. distillate per day, 16/64-in. choke, GOR 50,145, TP 3,300 psi., 55° gravity.

SOUTH LOUISIANA WILDCAT FAILURES

Cameron Parish: William Helis 1 State Lease 133, Lake Arthur, 2-12s-4w, dry, TD 10,490 ft.

Sohio Petroleum Co. C-1 Miami Corp., Grand Lake area, 15-14s-4w, dry, TD 10,996 ft.

PERMIAN BASIN

Coke County Wildcat Tests Oil in Strawn

MIDLAND.—Barnsdall Oil Co. 1 Harris Davenport, League 475, Seth Clark Survey, northeastern Coke County wildcat 4½ miles west and slightly south of Fort Chadbourne field of Runnels County, had a favorable showing of oil in the Strawn section. On a 90-minute drill-stem test from 5,375-93 ft., there was gas at the surface in 8 minutes. Recovery was 50 ft. of oil and gas-cut mud, 1,000 ft. of free oil, and 300 ft. of salt water. The top of the oil-saturated section has been placed at 5,312 ft., a previous test from that depth to 5,335 ft. having recovered 95 ft. of oil and gas-cut mud. Operator was deepening the prospect below 5,500 ft. in the Pennsylvanian. Humble Oil & Refining Co. 2 Sallie Odom, Felix Sosa Survey, 2¾ miles northwest of the discovery of Fort Chadbourne field, on a 75-minute drill-stem test of the Strawn from 5,502-22 ft. developed a slight blow of gas at the surface in 59 minutes. Recovery was 350 ft. of heavily oil and gas-cut drilling mud. Operator deepened to 5,542 ft. in lime and was running another drill-stem test.

Andrews County.—Magnolia Petroleum Co. 18-B Cowden Section 12, Block A-55 PSL Survey, tested 242 bbl. of 40.5°-gravity oil daily through ⅜-in. choke, from the Fusselman. The discovery is 2 miles southeast of Dollarhide pool. It will be completed dually: from the Devonian at 10,186-10,201 ft. and from the Silurian (Fusselman) at 11,000-28 ft. and 11,056-82 ft.

Gaines County.—Magnolia 2 Flanagan, Section 9, Block A-23, PSL Survey, north offset to the discovery in Flanagan Clear Fork field, plugged back with plastic from 7,244 to 7,222 ft. After plugging back, recovery on the swab was 26 bbl. of new oil in 4 hours. Swabbing continued with 3,000 ft. of oil in the hole. Shell Oil Co. 1 Andrews, Section 2, Block A-23, PSL Survey, ⅝-mile northeast outpost to Flanagan field, was circulating to run electrical survey at 10,480 ft. in Devonian, which was encountered low structurally.

Upton County.—Humble 1 First National Bank of San Angelo, Section 5, Block Y, GC&SF Survey, ⅜-mile northwest outpost to Benedum pool, failed to develop production from the Fusselman through perforations in liner from 11,460-85 ft. No oil was recovered on tests through the perforations, which will be squeezed for testing higher in the formation. The well had flowed 13 bbl. of 54°-gravity oil per hour on test from 11,396-11,490 ft. Six miles north of the area, Humble 1 Ralph Pembrook, Block X, C. C. DeWitt Survey, was drilling below 11,390 ft. in shale.

WEST TEXAS (DISTRICTS 8 & 7-C) SUCCESSFUL WILDCATS

Cochran County: H. L. Cain and H. G. Maxey 1 L. S. Roulain et al, Tract 8, League 130, Carson CSL Sur., flowed 188 bbl. of 31°-gravity oil a day, 1-in. choke, GOR 1600-1, top pay 4,835 ft., TD 4,888 ft.

Coke County: Humble 1 James L. Brunson, Sec. 331, N. Eastland Sur., 2 mi. S. Bronte field, pumped 34 bbl. of 46°-gravity oil a day, open 2-in. choke, GOR 191-1, top pay 4,375 ft., TD 5,864 ft., elev. 1,810 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Borden County: Ryan, Hayes & Burke 1 H. B. Herd est., Sec. 418, Blk. 97, H&TC Sur., 9½ mi. NE Gail, dry, TD 8,550 ft., Ellenburger 8,470 ft., Mississippian 8,274 ft., reef 7,884 ft.

Seaboard Oil 1 J. B. Clayton, Sec. 47, Blk. 32, T-4-N, T&P Sur., 5 mi. E Seaboard & Pan American 1 T. J. Good, dry, TD 8,210 ft., Sprayberry 5,750 ft., Dean 7,095 ft., reef 8,075 ft., elev. 2,460 ft.

Pecos County: Hunt Oil 5 Elsinore Royalty

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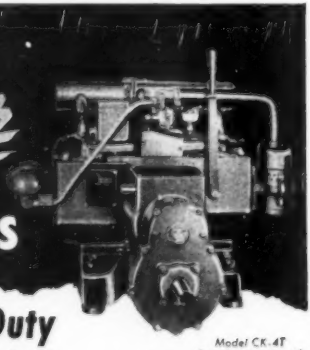

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Schleicher County: Al. P. Groebl et al 1-A Will Lovelace, Sec. 4, Blk. M, GH&SA Sur., 7 mi. SE Eldorado, dry, TD 1,000 ft., elev. 2,382 ft.

Tom Green County: George W. Strake 1 W. C. Weddell, Sec. 68, Blk. 5, H&TC Sur., 10 mi. SW Water Valley, dry, TD 1,348 ft., San Andres 1,238 ft., Clearfork 1,297 ft.

Ward County: J. C. Barnes & G. E. Hall 1 S. F. Hayzlett, Sec. 17, Blk. 5, H&TC Sur., 2 mi. N Grandfalls, dry, TD 9,255 ft., elev. 2,507 ft.

SOUTHEASTERN NEW MEXICO

HOBBS—R. W. Fair 1 Santa Fe, 22-19s-26e, 4 miles south of Dayton pool, Eddy County, was treated with 500 gal. of acid at 2,161-76 ft., and swabbed 6 bbl. of oil in 10 hours. It has been retreated with 1,000 gal. acid and is testing. Carper Drilling Co. will drill a 2,000-ft. wildcat, 1 V. L. Gates, 12 miles southwest of Black River field in the southwest part of the county.

Lea County.—Amerada Petroleum Corp. 1 Caudle-Federal, 10-12s-33e, wildcat 1 mile southwest of 1-BTA discovery, at plugged back depth of 9,045 ft., perforated casing from 9,001-20 ft. It was acidized with 3,000 gal. and perforated from 9,028-40 ft., then retreated with 2,000 gal. and flowed 376.63 bbl. of oil in 23 hours through $\frac{1}{2}$-in. choke. Operator continued testing.

Magnolia Petroleum Co. 1 Markham, 11-9s-35e, east of the Pennsylvanian discovery, 5 miles northwest of the Crossroads field, on a 4-hour drill-stem test from 8,810-70 ft., using 630 ft. water blanket, recovered water blanket that was slightly oil and gas-cut, plus 210 ft. of gas-cut drilling mud. Flowing pressure was 390 psi.

NEW MEXICO WILDCAT FAILURE

Eddy County: Amerada 1-BTA State, 2-12s-33e, 12 mi. NE Caprock pool, dry, TD 11,766 ft., Devonian 10,150 ft., Montoya 11,344 ft., Simpson 11,604 ft., Ellenburger 11,$\frac{1}{2}$70 ft., elev. 4,235 ft.

EASTERN TEXAS

Gas-Distillate Discovery Attempts Dual Completion

DALLAS.—Atlantic Refining Co. 1 Isom, E. A. Merchant Survey, opened a new gas-distillate area in northwestern Harrison County, 7$\frac{1}{2}$ miles northwest of Hallsville. The well flowed an estimated 40,000,000 cu. ft. of gas daily from the Rodessa section through casing perforations at 6,734-93 ft. Flowing pressure was 2,000 psi. Packer was set at 7,333 ft. and the Travis Peak section acidized with 750 gal. in an attempt for dual completion. The discovery is 4 miles south of Whelan pool, a gas-distillate area which also produces from the Rodessa and Travis Peak.

In Anderson County, The Texas Co. 1 Phill E. Laughlin, I. P. Rinehart Survey A-661, found a new Rodessa producing horizon in Blackfoot field. On a 1-hour drill-stem test from 9,093-9,126 ft., using 2,600-ft. water cushion, in 15 minutes it unloaded water cushion when 25 stands were pulled, and recovered water cushion and 60 ft. of oil.

R. W. Fair 2 Angus Wynne, B. S. Newman Survey, confirmation well 680 ft. southwest of the discovery in the new Walter Fair Paluxy pool in the Cedarvale area of Kaufman County, had 14 ft. of oil-saturated sand in the Paluxy. Top of pay is at 4,968 ft. with total depth at 4,988 ft. Drill-stem test was being run on the sand. The operator has staked a third test, 1-B Wynne, 800 ft. north of the discovery in the John Spikes Survey.

Amerada Petroleum Corp. 3 Coke, Joseph Knight Survey, discovered Rodessa production in Coke pool, northeastern Wood County. It flowed 320 bbl. of oil in 8 hours through perforations from 8,200-16 ft. after being acidized with 500 gal.

EAST TEXAS (DISTRICTS 5, 6 & 6-P) SUCCESSFUL WILDCAT

Grayson County: Standard Oil of Texas 1 Beth Brown et al, H. C. Atkinson Sur. A-22, $\frac{1}{2}$ mi. E Sherman, pumped 193 bbl. of 30.6°-gravity oil a day, top of pay 3,348 ft., TD 4,541 ft.

EAST TEXAS (DISTRICTS 5, 6 & 6-P) WILDCAT FAILURES

Denton County: Sussex Oil 1 Clyde Braman, Jason Smith Sur. A-1146, 2 mi. SE Pilot Point, Ellenburger 2,560 ft., dry, TD 2,709 ft.

Henderson County: Carter-Gragg et al 1 Mrs. M. L. Levine, T. D. Frizzell Sur. A-1070, 3 mi. NE Cayuga, dry, TD 4,977 ft., Austin chalk 4,090 ft., sub-Clarksville 4,520 ft., Woodbine 4,932 ft., elev. 4.5 ft.

Morris County: Ray Holbert et al 1 W. S. Thigpen, W. O. Mathews Sur., 22 mi. SE Mt. Pleasant, dry, TD 4,292 ft., Austin 3,690 ft., sub-Clarksville 3,812 ft., Woodbine 4,133 ft., elev. 346 ft.

Navarro County: J. L. Collins & Co. 1 Murphy Williams, Lewis Powell Sur., 4 mi. NE Corsicana, dry, TD 2,782 ft., elev. 338 ft.

ROCKY MOUNTAIN

Oak Creek, Colo., Wildcat Recovers Morrison Oil

DENVER—Casing has been cemented at the R. E. Havenstrite wildcat, 2 Ryles, NW SW NE 2-3n-86w, at Oak Creek, Routt County, Colorado, following recovery of oil from the Morrison on drill-stem test. The well found saturation in a 25-ft. section of sand in that formation, which was topped at 6,305 ft. On 2-hour test with total depth at 6,747 ft., the well filled with 6,000 ft. of 38°-gravity oil. Pipe was cemented at 6,644 ft. and the well will be tested this week. Closest production to the site is at Two Creek, where The Texas Co. has produced more than 2,000,000 bbl. of oil from shallow shale wells. Last year General Petroleum Corp. made a Shinarump gas discovery in the Pagoda area, 12 miles northwest of Oak Creek.

Two failures have now been plugged in the drilling campaign following discovery of oil in the Muddy sand in the Denver basin of southwestern Nebraska. Most recent is Ideal Drilling Co. 1 Baker, NE NE SE 20-16n-49w, on a farmout from Frontier Refining Co. of Denver. The well topped the Muddy at 4,542 ft., and with total depth at 4,616 ft. water was recovered on drill-stem test. The well is 4 miles northwest of Ohio Oil Co.'s discovery well, and is approximately 100 ft. lower structurally. The first failure was Roberts Brothers' well 3 miles southeast of the discovery. In the meantime Ohio is drilling below 4,800 ft. on its north extension. This well cored 41 ft. of saturation in the Muddy and will apparently be a good producer in that formation. The operator found water in sands below the Muddy but is continuing to drill the test through the Dakota-Lakota series.

A new discovery 3 miles west of production in Fiddler Creek field has renewed interest in this area of Wyoming. Mule Creek Oil Co. 1 Martin-Conley, SE NE NE 25-46n-66w, Weston County, flowed an average of 116 bbl. of 38°-gravity oil on 8-hour test. The Newcastle was topped at 5,685 ft. and was saturated to 5,697 ft., with total depth at 5,717 ft. Dry holes have been drilled southeast and northwest of the well, and some operators believe the well has opened a new pool in the area, rather than a 3-mile extension to Fiddler Creek field.

The California Co. is testing its discovery on the Borie structure, Laramie County, Wyoming, at 1 Morton-King. CE$\frac{1}{2}$ NW SW

13-13n-68w. The well flowed 121 bbl. of 39.2 -gravity oil in 11½ hours from the Muddy with total depth in new hole at 8,570 ft. The well was drilled to 11,374 ft. in granite, after testing 2,200 ft. of oil on 30-minute drill-stem test from the Muddy when the formation was drilled. After plugging back to the zone, California was unable to recover a fish in the hole and whipstocked to redrill the section.

COLORADO WILDCAT FAILURE

Moffat County, Coles Dome: Pitts-Colorado Oil Co. 1 Williams, C SW NW 2-3n-92w, TD 3,314 ft., dry, Frontier 2,895-2,960 ft., Dakota 3,301 ft.

WYOMING WILDCAT FAILURES

Hot Springs County, Brooks anticline: Continental-Phillips 1 Brooks, NE SW SW 31-9n-3e (WRM), TD 4,787 ft., dry, Dakota 1,443 ft., Lakota 1,613 ft., Sundance 1,900 ft., Gypsum Springs 2,135 ft., red beds 2,339 ft., Curtis sand 2,520 ft., Dinwoody 3,546 ft., Embar 3,594 ft., Tensleep 3,804 ft., Amsden 4,130 ft., Madison 4,400 ft.

Laramie County, Howard Dome: Indian Basin Oil Co. 1 Indian Hill, SW NW NW 13-18n-65w, TD 6,180 ft., dry, Pierre 3,260 (?) ft.

Park County, Franks Fork: Taylor Oil Co. 1 Thelft, TD 5,108 ft., C SW SW 23-48n-103w, dry, Frontier 580 ft., Mowry 1,226 ft., Muddy 1,812 ft., Dakota 2,135 ft., Lakota 2,385 ft., Morrison 2,455 ft., Sundance 2,620 ft., Gypsum Springs 3,035 ft., Phosphoria 4,144 ft., Tensleep 4,299 ft., Amsden 4,505 ft., Madison 4,892 ft.

MONTANA WILDCAT FAILURE

Liberty County, Marias River Dome: O'Neil 1 Pugsley, C NE SW 29-30n-5e, TD 2,471 ft., dry, Ellis-Madison 2,358 ft.

UTAH WILDCAT FAILURE

Uintah County, East Ashley Valley: Utah-Vernal Oil Co. 1 Caldwell, SW SW SW 20-5s-23e, TD 4,447 ft., dry, Frontier 381 ft., Dakota 719 ft., Morrison 807 ft., Curtis 1,697 ft., Entrada 1,767 ft., Carmel 1,979 ft., Navajo 2,085 ft., Chinle 2,776 ft., Phosphoria 3,624 ft., Weber 3,757 ft.

WESTERN NEBRASKA WILDCAT FAILURE

Cheyenne County: Roberts Bros. 1 Thompson, NW NW SE 18-15n-48w, dry, TD 4,462 ft., sand 4,431 ft.

ILLINOIS

Wildcat in Wayne County Flows on Drill-Stem Test

MATTOON.—A new producing area a mile north of Orchardville in Wayne County appears to have been found by Russell P. Johnson in his 1 Edward Vest, NE NW SW 16-1n-5e. In a drill-stem test of McClosky lime at 2,996-3,004 ft., the well flowed clean oil, showing oil within 30 minutes after the tester was opened. With 5½-in. casing cemented at 2,990 ft., operators are preparing to complete. The well is about 2 miles west of West Johnsonville pool and about a mile south of some small production which is being opened in Section 9.

At the northeast end of North Inman pool, about 3 miles southwest of New Haven, Gallatin County, White River Drilling Co. is completing an unusually good well for the area in its 1 Moye, NE SE SE 36-7s-9e. The well swabbed and flowed 35 bbl. per hour from Aux Vases at 2,801-10 ft. (total depth 2,816 ft.) following a 3,000-gal. acid treatment of the pay. Pumping equipment is being installed for further testing. Rig is being moved in for 2 Moye, a 10-acre location south of the discovery.

Hayes Drilling Co. et al. 1 Brown, SE NW NW 29-5s-14w, 2 miles east of North Maunie pool and about the same distance west and south of South New Harmony pool, White County, encountered good saturation in the Aux Vases at 3,003-13 ft. A 30-minute drill-stem test of the zone resulted in a good showing of gas and a recovery of 35 ft. of oil and 40 ft. of oil-cut mud. After being drilled to 3,133 ft., hole was plugged back to 3,043 ft. and 7-in. casing cemented at 2,998 ft.

ILLINOIS WILDCAT FAILURES

Clay County: George & Wrathers 1 Madison, SE SE SE 22-4n-5e, dry, TD 2,808 ft.

Coles County: L. K. Boyd 1 McAdams, SE NE NW 5-13n-14w, dry, TD 561 ft.

Edgar County: General Oil Development Co. 1 Barlet, SW NE SW 15-13n-13w, dry, TD 500 ft.

W. W. Henigman 1 Baker, NE NW NW 16-13n-13w, dry, TD 546 ft.

Nance & Vivadelli 1 Guyer, SE NE SE 36-14n-14w, dry, TD 505 ft.

Gallatin County: Robinson & Puckett 1 Seets, NW NW SE 17-8s-9e, dry, TD 3,003 ft.

Jefferson County: C. E. Brehm 1 Burr Oak, NE SE SE 4-4s-2e, dry, TD 2,805 ft.

Macoupin County: H. A. Lang Drilling Co. 1 Hoffman, SE NW NW 18-7n-6w, dry, TD 545 ft.

Madison County: Joe Kesl, Jr. 1 Lucker, SE SE SW 36-6n-7w, dry, TD 800 ft.

Richland County: Ashland Oil & Refining Co. and Hack Drilling Co. 1 Fout, NE SW SE 9-2n-8e, dry, TD 3,215 ft.

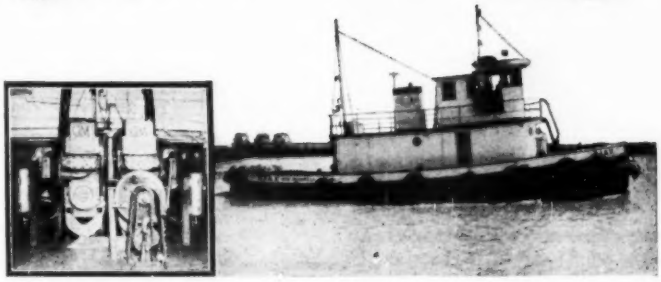
L. L. Chevalier et al 1 Luther-Litherland, SW NW NW 16-3n-14w, dry, TD 3,255 ft.

Saline County: B. M. Heath 1 Vassse's Community, SW SW NW 36-7s-7e, dry, TD 2,413 ft.

Shelby County: P. Doran and Lannery 1 Whittington, NW NW NE 8-9n-2e, dry, TD 1,867 ft.

Washington County: H. F. Robinson et al 1 Gutjohn, NW NW NW 24-3s-5w, dry, TD 2,405 ft.

GM Diesel Powered



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OHIO, KENTUCKY

West Side of Baker Pool Gets 75-Bbl. Producer

COLUMBUS—L. L. Dittoe et al 1 Bert Clouse, Section 33, Hopewell Township, Perry County, an offset to the 1 Weed, along the west side of Baker pool, logged the Clinton at 2,929-66 ft. with a good showing of oil, natural, and 75 bbl. in 24 hours after a 90-qt. shot.

Glenn Harmon et al 1 Emma Mason, Lot 34, Wellington Township, Lorain County, a south extension to the new West Wellington pool, found the second Clinton at 2,29-77 ft. with 1,200,000 cu. ft. of gas natural.

Nollem Oil & Gas 1 Glazier, Lot 34, Washington Township, Tuscarawas County, had gas shows in both the first and second sands, but only totaled 116,000 cu. ft. The first Berea came in at 882-917 ft. and the second at 924-44 ft.

The Oxford Oil 4 Victor Scheibe, Lot 10, Clark Township, Coshocton County, after producing oil from the Newburg sand, was drilled down to the Clinton where 940,000 cu. ft. of gas, natural, was found. The sand was logged at 3,587-3,607 ft.

WESTERN KENTUCKY

OWENSBORO—The new area being opened in Daviess County between East Guffie and Glenville pools looked somewhat better the past week with a substantial increase in production by the discovery well, Wasson Oil Co. 1 Goodwin, C N½ SW NE 17-N-2E. Initially, the well swabbed only 1 bbl. per hour. However, in later tests, it swabbed and flowed at the rate of 314 bbl. per day. Production is from McClosky lime at 1,891-94½ ft. with open hole below 1,880 ft. The well is about 2 miles from production. Pumping equipment is being installed for further tests.

Ryan Oil Co. and George & Wrather 1 Charles Greathouse heirs, SE cor. 24-Q-20, new pool opener, 2½ miles south of Powells Lake pool, Union County, and about 4 miles northeast of Uniontown production, is pumping about 6 bbl. per hour. The Cypress sand at 2,243-51 ft., from which it is producing, is a new pay zone for the general area. George Engle and J. E. McCauley 1 Greathouse, SW cor. 23-Q-20, east offset, has reached the pay, and in a 2-hour drill-stem test of the zone at 2,234-41 ft., got a good show of gas and recovered 1,020 ft. of clean oil and 90 ft. of oil-cut mud. Casing has been run to 2,238 ft.

WESTERN KENTUCKY SUCCESSFUL WILDCATS

Daviess County: O. D. Vickers 1 Bell, SW NE SW 9-P-27, IP 21 bbl., Jackson 1,522-28 ft., TD 1,530 ft.

Union County: Sun Oil Co. 1-B Reisinger, SW NE NE 3-N-19, IP 126 bbl., McClosky 2,684-91 ft., TD 2,694 ft. (Extension South Morganfield pool).

WESTERN KENTUCKY WILDCAT FAILURE

Grayson County: C. C. White et al. 1 Fentress, NW NE NE 21-N-3E, dry, TD 431 ft.

EASTERN KENTUCKY

ASHLAND—Location has been made for a rank wildcat test in Cumberland County, in the south central portion of the state. It is Coolie Ellis 1 Merley, 9-C-50, near the town of Burkesville, the county seat. The well is designed to test deep horizons on the Meshack Uplift.

In Owsley County, 9-L-69, Petroleum Exploration is drilling at 1,333 ft. at 1 B. Botner in the heart of the old Vincent gas field. It will test possible pays below the Corniferous limestone, the normal producing horizon for the field.

In Furnace gas field of southern Powell and northern Estill counties, Petroleum Exploration completed 1 Lucy McIntosh, 22-P-68, for 4,700,000 cu. ft. of gas daily from St. Peter sand at 2,527-90 ft. Total depth is 2,593 ft. in Knox dolomite topped at 2,590 ft.

EASTERN KENTUCKY WILDCAT FAILURES

Powell County: Raydure-Marcum 1 Robert Bellamy, 17-P-69, dry, TD 2,668 ft., Tyrone lime 1,930 ft., St. Peter sand 2,599 ft. with 1,500 ft. of water.

Menifee County: A. H. Carpenter 3 Shelby Palmer, Middle Fork of Indian Creek, dry, TD 550 ft., Devonian brown shale 348 ft., Corniferous lime 534 ft.

INDIANA

EVANSVILLE—Two extensions, one opening a new pay, for the new Arda pool, on the Pike-Knox County line, are in the making. Lohmann & Johnson et al, 1 Ovie Stewart, NW NE NE 14-1n-8w, Pike County, ¼ mile southwest of the discovery well, is being put on the pump to test showings encountered in the Aux Vases, a new pay, at 1,231-61 ft. Total depth is 1,370 ft. in the McClosky lime, from which the discovery well is producing at 1,297-1,302 ft.

Spear Oil Co. 1 Prentice Martin, SW SE SW 11-1n-8w, ½ mile northwesterly from the Stewart well in Knox County, and about ¾ mile west of the discovery well, is preparing to test showings in the McClosky, the discovery-well pay zone. Total depth is 1,360 ft. with 5½-in. casing at 1,356 ft. The Arda area is northeast of Petersburg pool.

Winmar Oil Co. 1 Parkinson, NE NE NW 11-1s-12w, new pool opener in Knox County, has been completed on the pump for 120 bbl. of oil per day natural after having swabbed at the rate of 200 bbl. daily on previously reported tests. Pay zone is the O'Hara lime at 2,262-69 ft. The discovery is about 1½ mile east of production in Mt. Carmel pool and about the same distance north of North Mt. Carmel pool.

George & Wrather et al, 1 Leslie Tenison,

(Continued on page 153)

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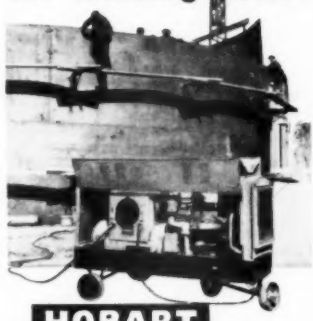

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PARKERSBURG

Lower Tanker Rates Increase Competition

(Continued from page 53)

ing crude supply and use naturally are not considered in comparisons of this kind. One of the most important is the refining characteristics of the crude oil itself. High-sulfur Persian Gulf crudes are in general less desirable and not feasible to use in some plants. Studies have been made of this characteristic of Middle East oil, and estimates of the greater cost to the refiner range up to 30 cents a barrel processed.

It is also necessary to bear in mind that the production of crude oil in foreign areas is usually carried on by an integrated company which takes the oil into its own refineries and distributes the products through its own sales organization. Oil not taken by the producing company is often sold under long-term contract at unrevealed prices. In foreign areas there are no posted crude prices such as found in the United States.

Costs, Rates Fluctuate

Furthermore, tanker rates and costs are constantly fluctuating. The price of bunkers is a major item in tanker costs. Large integrated companies usually maintain a fleet of about 60 per cent company-owned vessels, supplementing as necessary in the charter market. These open-market rates can change rapidly.

To arrive at the f.o.b.-port price for Texas oil, it is necessary to add in the usual gathering, pipe-line, terminal, and handling charges. For West Texas oil, these amount to 28.4 cents a barrel, which with the $2.38 price of 33° gravity West Texas oil gives $2.664. East Texas oil with a flat price of $2.65 costs 18.7 cents additional at the port. A crude-buying organization has computed an average of East and West Texas crude with an average gravity of 35.75° A.P.I. would cost $2.71875 f.o.b. Houston.

Present f.o.b. selling price of 33° gravity crude from Eastern Venezuela is $2.59 f.o.b. Puerto la Cruz. In Colombia, Tibu 33° gravity crude from the Barco is now at $2.59. In Venezuela and Colombia, most crudes of the lower gravities have declined in price in recent months.

El Dificil crude of 41° gravity in Colombia is priced at $2.83 at the port. Cantagallo crude of 21° gravity is $2.11. For De Mares, crude for fuel-oil purposes is $2.13, with other De Mares oil at $2.30. All the Colombian crudes have dropped in price except the higher-gravity oils from Barco and Dificil.

Only One Set Price

The only standard price for Middle East oil is that for which it is being currently sold in Europe. Sales elsewhere presumably would be at negotiated prices, with the seller considering the necessity of meeting competition in the market concerned and also the factors of supply and demand. What Persian Gulf oil is moving to the United States has been almost wholly to the refineries of the producing companies.

Actual costs of production of oil in the Persian Gulf area are not known, but owing to the tremendous productivity of the fields, they are regarded as being considerably below those elsewhere. Various unofficial estimates range up to 75 cents a barrel, but again it is not known whether such figures take fully into consideration all the expenditures the companies make outside the strict producing operations themselves.

After the war, crude oil sold in Europe from the Persian Gulf was generally priced on a delivered basis whereby it would meet the competition of Caribbean and Gulf Coast shipments at individual destinations. Under these circumstances, crude in Spain, for example, would sell lower than in Italy, since Gulf or Caribbean prices bore that relationship.

The Economic Cooperation Administration came into operation in April 1948 and began financing considerable purchases of dollar-produced crude oil from the Middle East. Subsequently European sales were made on a strict parity with Venezuela, and then one of the major producers in the area wiped out the "reverse" transportation differentials that had existed for Europe. This brought about a general price of $1.97 for 33° gravity crude and $2.03 for 36° gravity (a 2-cent differential) f.o.b. the Persian Gulf.

This was the situation up to a few months ago when a second of the producing companies announced a 15-cent reduction for its Persian Gulf oil. The other companies, including the sterling production, followed, and the price for 33° gravity oil came down to $1.82.

Committee Named to Study Imports Question

WASHINGTON.—Personnel of the committee authorized by the National Petroleum Council at its July 28 meeting to make the study of imports, including their effect on the domestic industry, domestic economy, and national security, requested by Interior Secretary J. A. Krug was announced last week by NPC Chairman Walter S. Hallanan.

George A. Hill, Jr., Houston Oil Co., Houston, was named by Hallanan as chairman of the committee.

Other members will include Jacob Blaustein, American Trading & Production Corp., Baltimore; Rush M. Blodget, Oil Producers Agency of California, Los Angeles; J. S. Bridwell, Bridwell Oil Co., Wichita Falls, Tex.; Russell B. Brown, Independent Petroleum Association of America, Washington; H. S. M. Burns, Shell Oil Co., New York; J. Frank Drake, Gulf Oil Corp., Pittsburgh; R. G. Follis, Standard Oil Co. (Calif.), San Francisco; B. I. Graves, Tide Water Associated Oil Co., New York; J. Parks Gwaltney, National Oil Jobbers Council, Durham, N. C.; Harry B. Hilts, Atlantic Coast Oil Conference, New York; Eugene Holman, Standard Oil Co. (N. J.), New York; A. Jacobsen, Amerada Petroleum Corp., New York; W. Alton Jones, Cities Service Co., New York; John M. Lovejoy, Seaboard Oil Co. of Delaware, New York; B. L. Majewski, Deep Rock Oil Corp., Chicago; J. Howard Marshall, Ashland Oil & Refining Co., Ashland, Ky.; Brown L. Meece, Globe Oil & Refining Co., Chicago; Joseph L. Nolan, Farmers Union Central Exchange, St. Paul, Minn.; Frank M. Porter, Mid-Continent Oil and Gas Association, Oklahoma City; W. S. S. Rodgers, The Texas Co., New York; Fred Sehmann, National Stripper Well Association, Wichita Falls, Tex.; Harry F. Sinclair, Sinclair Oil Corp., New York; and Guy I. Warren, Texas Independent Producers and Royalty Owners Association, Corpus Christi, Tex.

House Wonders if Size Alone Requires Control

WASHINGTON.—A House judiciary subcommittee is wrestling with the problem of whether corporations may reach such a size that, for that reason alone, they should be subject to government regulation.

The subcommittee, headed by Rep. Emanuel Celler of New York, has just wound up several weeks of hearings at which it was made evident there is much concern over the growth of some corporations, particularly in fields where prices are administered, that is, set by the two or three leaders in an industry without genuine competition.

While the Temporary National Economic Committee investigation before the war went into this field, it was without authority to write legislation. The Judiciary Committee can and will write legislation, and its first steps in that direction may call for repeal of laws which have retarded rather than strengthened competition, such as the Miller-Tydings, Robinson-Patman, Bulwinkle and Webb-Pomerene Acts. These laws, which permit resale price maintenance, eliminate price discriminations, authorize railroads to maintain rate bureaus and provide for associations in export trade, all tend to make for "soft" competition, some subcommittee members believe.

During the hearings, however, Celler made it clear that the big corporations were his main target and he sought to develop the theme that when a business reaches a certain size, government control of some sort is necessary, either by making it a public utility or breaking it down into smaller units. This, in essence, is the theory of the Department of Justice, which has initiated several suits to break down big corporations, one recently against the duPont empire.

The subcommittee will resume its hearings late in October, when it will call on representatives of various industries to submit their views on the operation of the antitrust laws.

Bill to Tighten Land-Leasing Rules Stirs Up Major Fight

WASHINGTON.—A move by Louisiana to increase its take from leases on the so-called acquired lands held by the federal Government, backed up by the Interior and Agricultural Departments, touched off a major fight last week before the House public lands committee.

Before the committee was a bill sponsored by Rep. A. Leonard Allen of Louisiana to amend the 1947 leasing act for acquired lands to provide that where competitive interest is evident, oil and gas leases shall be issued only to the highest responsible qualified bidder by competitive bidding.

Announcement early last month that a subcommittee headed by Rep. Clair Engle of California was preparing to hold hearings on the Allen bill and would welcome comment from industry associations aroused little interest and brought few responses, with no requests for permission to be heard.

A few days before the hearing, however, the Interior Department submitted a report on the bill, in which it not only expressed approval of the legislation but suggested a number of amendments which would further tighten up the leasing procedure, and reaction from the industry was instantaneous.

Hearing Postponed

It was originally proposed to hear Allen and Interior officials, as well as such oil men as might appear, August 5 and to have another session for industry witnesses from distant points on August 12. Washington representatives of several associations told the subcommittee the industry would need more time to prepare its testimony, and Engle reluctantly postponed the August 12 hearing until August 15.

Directly involved in the legislation are oil and gas leases on some 33,000,000 acres of lands acquired by the Government for forest and other purposes; less evident was a possibility that the Interior Department might at some time seek a similar tightening up of the conditions under which leases are granted on the public domain.

At the August 4 hearing, Allen admitted that the sole purpose of his bill to get competition and higher rentals for leases was to increase the dollar revenue of the 25 per cent of rentals which goes to the local authorities from leases in the Kisatchie National Forest, a 542,000-acre reservation on which eight leases comprising 13,717 acres have been granted and 47 applications for another 89,482 acres are pending.

Under the present law, Allen said, leases are being granted to the first qualified applicant at a rental of 50 cents an acre, the same as under the Mineral Leasing Act of 1920, while state and privately owned lands are bringing many times that much. The forest lands, he said, would bring $10 an acre or more if offered on competitive bids, which would give the counties a minimum of $2.50 instead of the 12½ cents they now receive.

Answering objections by Rep. Frank A. Barrett of Wyoming that enactment of his bill might seriously affect wildcatting on government lands in the West, Allen said he had no desire to hurt any other state and would be satisfied to have the measure amended to apply only to Louisiana.

The Department of Agriculture, which had granted two of the present leases in the Kisatchie National Forest on substantial bonuses, approved the Allen bill and, in fact, had suggested its wording, but the Interior Department, which granted the other six leases without bonuses, submitted a series of amendments which industry representatives will oppose.

Among other things, the department proposed to eliminate the waiver of rentals for the second and third years of a lease, which Jacob N. Wasserman, chief counsel for the Bureau of Land Management, said reduced the revenue from a 5-year lease to $1, and would substitute a graduated royalty for the 16½ per cent provided in the present law. As a partial offset, it would provide a 5-year extension of leases granted by competitive bidding as well as for noncompetitive leases.

House Passes Amendment to Gas Act

WASHINGTON. — Despite intimations that President Truman would veto the bill, the House last week voted to amend the Natural Gas Act to insure the exemption of independent producers and gatherers from Federal Power Commission regulations.

The likelihood that the President would veto any legislation going further than to exempt producers and gatherers whose pipe-line sales do not exceed 2,000,000,000 cu. ft. a year, as proposed by the FPC, was disclosed by Elmer B. Staats, acting director of the Bureau of the Budget.

In identical letters to the chairmen of the House and Senate interstate commerce committees, Staats said the pending measures would not be in accord with the President's program, but added that the President has stated that should some legislation be deemed necessary, he would have no objection to a bill along the lines of the FPC proposal.

In the Senate, committee chairman Edwin C. Johnson of Colorado charged the President and the FPC with switching their position, declaring that until he received Staats' letter he had every reason to believe the President still was in favor of exempting the independent producers and gatherers, since the FPC recommended similar legislation in the last Congress at which time it said that position was fully in accord with the President's program. Why, he asked, did the bureau wait until this late date to disclose the President's shift in position?

"Hereafter," Johnson wrote in reply to Staats' letter, "I hope you will not be so reticent or tardy about communicating to this committee your views or the views of the President on pending legislation when either of you switch your position."

The House, however, was deterred neither by the hint of presidential disapproval nor a warning by Rep. John W. Heselton of Massachusetts that legality of the legislation, if enacted, would be challenged in the courts on the ground that Congress could not legally sit after July 31, the date set for adjournment by the reorganization act of 1946.

It beat down an amendment proposed by Rep. Robert Crosser of Ohio, chairman of the interstate commerce committee, to limit the exemption to producers and gatherers whose sales to pipe lines do not exceed 2,000,000,000 cu. ft. a year, and another sponsored by Rep. Eugene J. Keogh of New York to extend the exemption to the producing operations of pipe-line companies.

The House refused to send the bill back to committee, by a vote of 187 to 124, and then passed the measure by a roll call vote of 183 to 131.

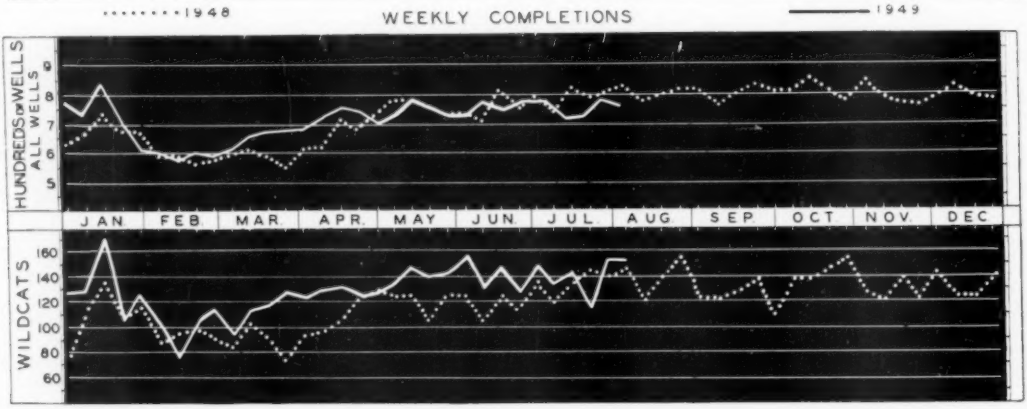
Debate on the measure was heated at times, with opponents charging the bill would put the independent producers on the "gravy train" and result in materially increased prices to consumers of gas. Supporters of the measure argued that it was designed merely to clear up confusion created by a Supreme Court opinion holding that the FPC had authority to regulate the activities of independent producers and gatherers although, it was pointed out, the commission had never sought to exercise that authority.

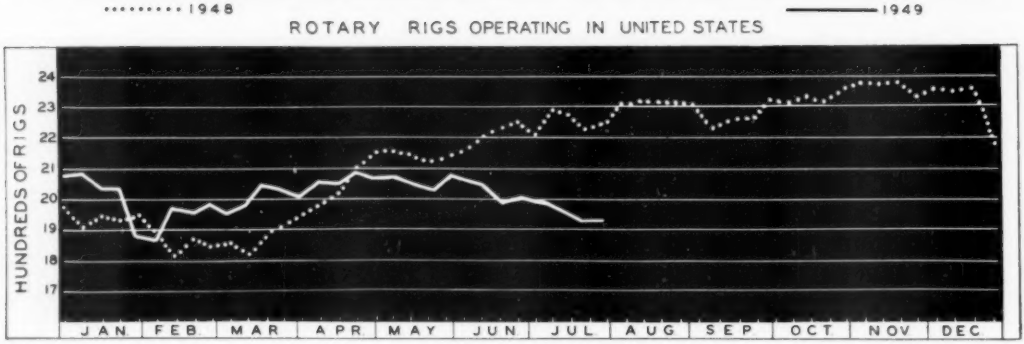
The measure has yet to be acted upon by the Senate where, however, similar legislation was favorably reported by the interstate commerce committee some weeks ago.

WEEKLY WELL COMPLETIONS . . . WEEK ENDED AUGUST 6, 1949

	Total of all wells					31 wk.		Wildcat completions and discoveries						Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	13	7	0	*6	14,512	624	894	0	0	0	0	0	0	0	0	0	0
Pennsylvania	21	6	5	†10	42,115	905	1,531	0	0	0	0	0	0	0	3	1	4
West Virginia	6	0	4	2	19,321	282	467	0	0	1	1	2	1	0	7	7	15
Ohio	25	10	10	5	42,973	620	767	0	0	0	0	0	1	0	2	21	24
Indiana	27	9	0	18	55,662	742	603	2	0	0	4	6	15	0	0	141	156
Kentucky	16	6	3	7	26,847	517	397	2	0	0	3	5	15	0	0	41	56
Illinois	56	17	0	39	132,980	1,453	1,315	0	0	0	14	14	35	0	1	244	280
Michigan	22	9	0	‡13	40,644	572	453	0	0	0	5	5	19	0	1	175	195
Kansas	67	37	8	§22	210,595	1,845	1,771	0	0	0	9	9	36	0	4	232	272
Neb., Mo., Iowa	1	0	0	1	1,462	15	3	0	0	0	1	1	1	0	0	10	11
Oklahoma	92	58	3	31	323,190	2,503	2,363	1	0	0	9	10	87	10	10	364	471
Texas	281	163	23	95	1,233,966	7,905	6,779	15	1	7	54	77	247	33	78	1,369	1,727
North Central (Dist. 7-B & 9)	98	57	0	41	256,734	2,615	2,113	9	0	0	20	29	110	0	11	541	662
West (Dist. 7-C & 8)	77	69	0	8	403,454	1,895	1,852	2	0	0	6	8	34	0	3	157	194
Panhandle (Dist. 10)	0	0	0	0	0	605	348	0	0	0	0	0	1	0	0	3	4
Eastern (Dist. 5, 6, & 6-P)	13	6	1	6	58,485	391	311	1	0	0	4	5	7	2	3	83	95
Gulf Coast (Dist. 2 & 3)	54	20	17	17	350,101	1,189	1,081	2	1	4	8	16	53	25	34	233	345
Southwest (Dist. 1 & 4)	39	11	5	23	165,192	1,210	1,074	0	0	3	16	19	42	6	27	352	427
Louisiana	51	33	5	13	326,141	1,279	1,284	1	2	0	3	6	36	12	4	125	177
Northern	28	18	5	5	93,583	706	846	0	0	0	1	1	3	2	0	54	59
Southern	23	15	0	8	232,558	573	438	1	2	0	2	5	33	10	4	71	118
Arkansas	4	1	0	3	13,040	182	162	0	0	0	1	1	3	0	0	36	39
Mississippi	2	0	0	2	11,184	204	232	0	0	0	1	1	4	0	1	60	65
Southeastern States	4	0	0	4	28,857	31	31	0	0	0	3	3	1	0	0	27	28
Montana	1	0	0	1	2,471	133	152	0	0	0	1	1	2	0	2	20	24
Wyoming	17	9	0	8	87,813	354	282	0	0	0	3	3	16	0	0	65	81
Colorado-Utah	6	1	0	5	23,746	84	145	0	0	0	2	2	2	0	0	32	34
New Mexico	5	3	1	1	29,755	306	357	1	0	0	0	1	9	0	1	30	40
California	35	27	0	8	165,780	1,573	1,679	0	0	0	6	6	26	0	6	266	298
Total United States	752	396	62	294	2,836,054	22,129	21,667	22	3	8	120	153	556	55	120	3,266	3,997
Total previous week	789	423	57	309	2,894,527	21,377	20,832	22	1	7	124	154	534	52	112	3,146	3,844
Total August 7, 1948	835	471	64	300	2,955,420			25	2	4	114	145	515	44	158	2,849	3,566

Service wells included: *6, †7, ‡3, §11.





DAILY AVERAGE PRODUCTION FOR WEEK

	Aug. 6 crude oil	B. of M. July demand	July 30 crude oil
Alabama	1,250	1,350	1,200
Arkansas	72,830	87,000	72,550
California	900,300	928,000	904,400
Colorado	65,000	65,000	65,000
Eastern	59,850	60,850	59,000
Florida	1,275	1,400	1,350
Illinois	184,400	170,000	178,800
Indiana	29,000	24,000	28,500
Kansas	225,100	302,000	243,650
Kentucky	24,000	21,000	23,400
Louisiana	474,590	510,000	473,750
North Louisiana	105,290		105,700
South Louisiana	369,300		368,050
Michigan	48,100	46,000	49,000
Mississippi	96,150	109,000	97,100
Montana	26,750	24,000	27,800
Nebraska	550	700	600
New Mexico	125,125	131,000	136,300
Oklahoma	378,000	410,000	375,500
Texas	1,838,200	2,150,000	1,805,000
Dist. 1 (Southwest)	25,740		25,570
Dist. 2 (Southwest)	112,000		108,825
Dist. 4 (Southwest)	177,600		174,675
Dist. 3 (Gulf Coast)	338,860		334,905
Dist. 5 (Eastern)	32,100		32,150
Dist. 6 (Eastern)	79,000		78,700
East Texas field	222,400		221,000
Dist. 7-C (West)	42,300		41,425
Dist. 8 (West)	519,100		499,375
Dist. 7-B (W. Central)	57,600		57,400
Dist. 9 (N. Central)	137,300		137,175
Dist. 10 (Panhandle)	94,200		93,800
Utah	1,050	700	1,000
Wyoming	127,000	118,000	129,500
Total United States	*4,678,520	5,160,000	4,673,400
Change from previous week, up	5,120		
Canada	60,500		59,120
Total U. S. production January 1-August 6			(1,114,171,440 bbl.
Same period last year (crude plus cond.)			1,198,360,865 bbl.

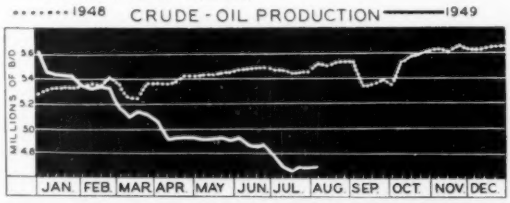
*Not including 74,075 bbl. condensate. (Including 18,052,065 bbl. condensate.

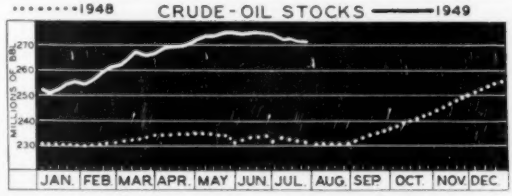
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

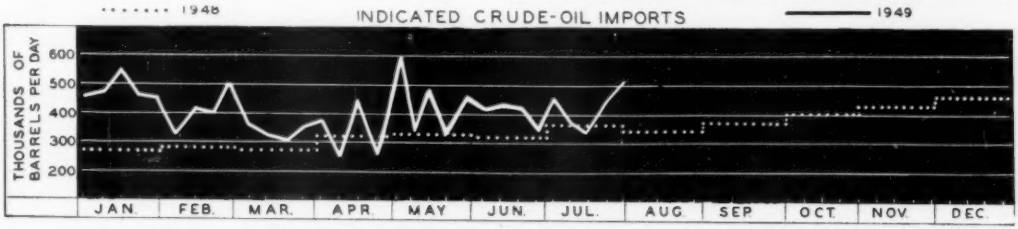
(Thousands of barrels)

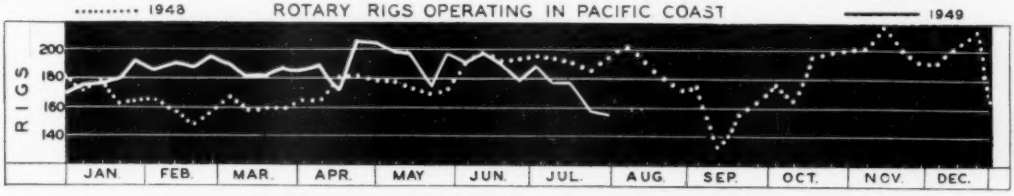
State of origin—	July 30, 1949	July 23, 1949	July 31, 1948
Pennsylvania Grade	3,257	3,064	2,792
Other Appalachian	2,068	2,069	1,016
Ill., Ind., Mich.	15,263	15,366	11,717
Arkansas	2,981	2,960	2,574
Louisiana	14,980	15,407	10,658
North	3,703	3,671	2,919
Gulf	11,277	11,736	7,739
Mississippi	3,168	3,263	2,803
New Mex.co	7,530	7,757	5,822
Oklahoma and Kansas	39,350	39,054	34,279
Texas	125,584	125,476	113,256
East Texas	16,659	16,832	15,893
West Texas	50,372	50,623	43,700
Texas Gulf	29,418	29,550	28,558
Other Texas	29,135	28,471	25,105
Rocky Mountain	14,197	(14,205	9,362
California	35,470	35,760	30,890
Foreign	8,208	7,769	5,751
Total United States	271,999	272,150	230,720

*Bureau of Mines. (Revised.









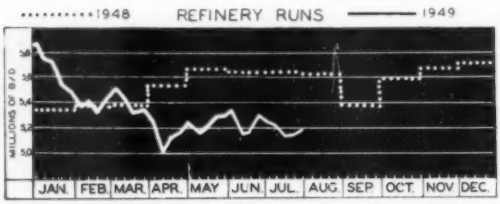
Refining Statistics

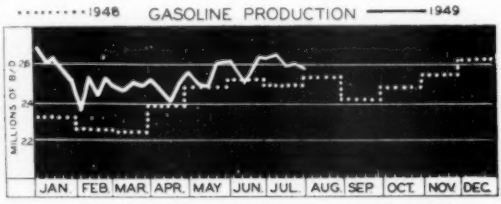
A.P.I. REFINERY REPORT, JULY 30

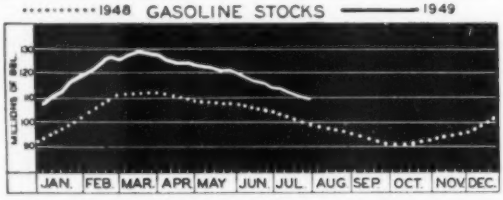
(Thousands of barrels)

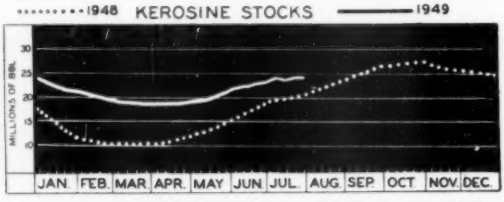
District	Daily avg. crude runs	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, July 1948				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production			
											Gasoline*	Kerosine	Distillate	Residual
East Coast	744	337.4	24.7	169.9	155.3	25,160	10,163	21,963	10,272	891	320.7	43.5	170.6	222.6
Appalachian:														
District 1	72	33.3	4.1	7.4	8.7	2,549	430	688	517	93	40.0	4.8	12.1	11.1
District 2	63	35.9	1.3	4.4	10.2	1,098	147	222	290	36	15.5	1.1	4.6	10.0
Ind., Ill., Ky.	897	493.7	40.4	124.1	136.6	23,670	4,672	11,233	5,174	932	491.5	52.0	128.0	154.7
Okla., Kans., Mo.	412	230.0	17.7	78.9	53.0	9,867	1,533	5,623	2,313	483	246.2	22.8	87.0	79.0
Inland Texas	223	156.4	12.4	19.9	52.3	3,801	751	933	1,378	248	144.8	8.2	31.0	60.2
Texas Gulf Coast	1,225	598.7	59.4	214.3	228.0	15,884	2,857	11,313	7,336	1,395	601.5	102.8	295.2	259.9
La. Gulf Coast	424	210.4	35.7	111.1	49.8	5,503	2,335	4,418	2,057	435	185.5	45.1	92.7	77.9
N. La. and Ark.	77	29.4	3.9	11.9	13.7	2,735	478	945	317	84	30.5	7.5	12.2	19.5
Rocky Mountain:														
New Mexico	11	6.4		1.7	2.9	68	25	97	29	12	6.0	0.4	1.7	3.6
Other Rocky Mtn.	170	78.6	3.3	30.1	35.3	2,813	356	1,509	746	151	61.3	3.9	24.0	28.9
California	869	369.5	8.2	125.3	283.4	16,816	800	11,823	36,739	871	351.4	12.5	135.1	336.4
July 30, 1949	5,187	2,579.7	211.1	899.0	1,029.2	109,964	24,547	70,767	67,166	5,631	2,494.9	304.6	994.2	1,263.8
July 23, 1949	5,148	2,614.4	213.0	829.6	1,069.9	110,569	24,544	69,365	68,517					
July 31, 1948	5,774	2,520.9	316.1	969.3	1,330.1	99,201	20,936	52,429	48,618					

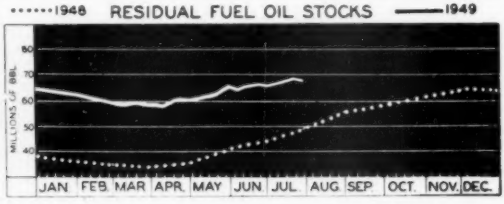
*At refineries including natural blended. †Finished and unfinished. ‡Revised in La. Gulf Coast.

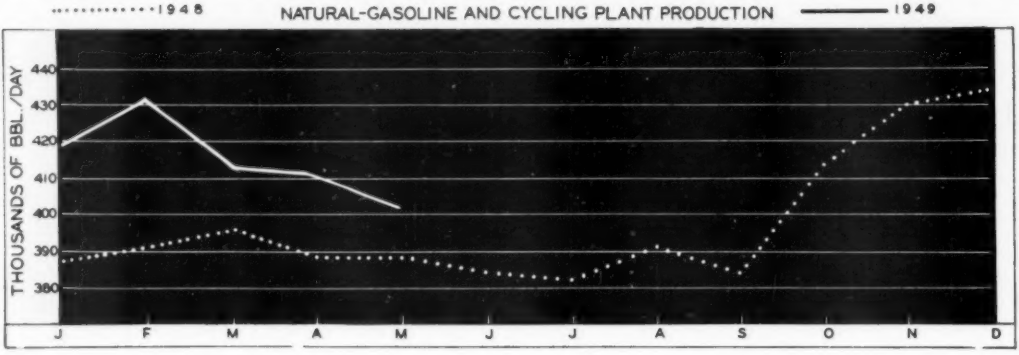












CRUDE PRICES GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.78			
19-19.9	1.85			
20-20.9	1.93	$2.25		$2.12
21-21.9	2.00	2.27		2.14
22-22.9	2.07	2.29		2.16
23-23.9	2.13	2.31		2.18
24-24.9	2.20	2.33	$2.56	2.20
25-25.9	2.26	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.40
Eastern Ill. and Western Ind.*	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°, †35° and above

HEAVY demand for residual fuel oil continues to brighten an otherwise featureless petroleum-products market. Prices for No. 6 heavy fuel oil and Bunker C were increased by 10 cents per barrel rather generally along the Atlantic Seaboard following the August 2 action of Esso Standard Oil Co. in posting this increase in New York and an increase of 3 cents on the Gulf Coast.

Prices of heavy fuel oil are still far below what they were before they started their sharp downswing last winter, but they are still below bituminous coal on the basis of heat equivalent, and evidence of a continued shift of industrial consumers from coal to oil indicates that the market will continue strong. For example, the Federal Power Commission reports that in June electric-utility plants used 15.7 per cent less coal than during June of 1948, but 20.1 per cent more gas and 61.7 per cent more fuel oil. Their fuel-oil consumption was 20.2 per cent more in June than in May, and on July 1 the utilities had only 49 days' supply of oil stocks compared with 79 days' a year before.

Independent market sources report that prices of light distillates are firming in the face of improving demand, but this is yet to be reflected in a rush of consumers to fill empty storage. The Bulletin of the National Association of Purchasing Agents reports a rather general feeling that the current low prices of distillates, particularly No. 2 heating oil, are close to bottom and that some time early in the fourth quarter prices will show an upward trend.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of August 8, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Tex. Gulf Coast
Regular gasoline, 73-75 octane	9⅝-10	11-11.5	9½-10
Premium gasoline, 78-80 octane	10⅜-11	12-12.5	10½-11
42-44 w.w. kerosine	7¾-8¼	7.75-8.4	7.50-8
No. 2 straw fuel oil	6⅜-6¾	6.6-7.4	6⅜-6½
No. 6 residual	$0.85-0.90	$1.70	$1.35

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5½	5	5¼
Grade 18-55	6.6	6	6.3

LUBRICATING OILS
South Texas

300 vis., No. 2-3 neutral	11
750 vis., No. 3-4 neutral	14
2,000 No. 5-6 neutral	16-16.5

LUBRICATING OILS
Mid-Continent

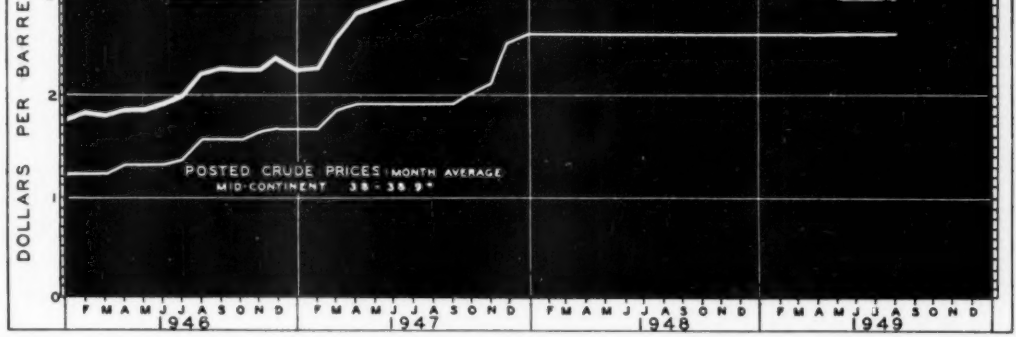
150-160 vis., D bright stock, 0-10 pp.	19
200 vis., No. 3 neutral, 0-10 pp.	12-14

Western Pennsylvania

144-155 vis., 10 p.t. bright stock	19.5
180 vis., 0 p.t. neutral	20.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	4.5



In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil

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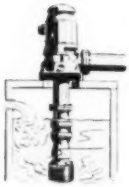

You're assured of full turbine pump utility and capacities with an extremely compact installation. Ideal for pumping from short or medium settings; capacities up to 30,000 g.p.m. are delivered from sumps, pits and surface water sources. For booster service, circulating, de-watering and a host of other applications.

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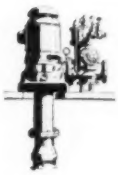

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EQUIPMENT MEN . . . in the News

Taylor Instrument Makes Executive Appointments

Lewis B. Swift, president of Taylor Instrument Cos., Rochester, N. Y., has announced several important changes

G. H. TAYLOR

H. J. NOBLE

in the executive personnel of the organization. At the most recent meeting of the board of directors, George H. Taylor, formerly assistant secretary, was elevated to the office of secretary. He takes the post left vacant by the death of Henry W. Kimmel.

Taylor joined the company in 1911, was made a director in 1928 and assistant secretary in 1934. Taking Taylor's place as assistant secretary is Rodney C. Mertz, director and company attorney. He came with the organization in 1943.

The board of directors of Taylor Instrument Cos. of Canada, Ltd., has elected Herbert J. Noble, executive vice president and treasurer of the parent company, a director and the new president and treasurer.

These offices were formerly held by the late Henry W. Kimmel. Noble joined the company in 1907. In 1934 he was elected a director, in 1938 treasurer, in 1946 vice president, and in 1947, executive vice president and assistant general manager.

Jones & Laughlin to Open Canadian Sales Office

J. L. Shakely, president, Jones & Laughlin Supply Co., has announced the opening within a few weeks of a new store in Edmonton, Alta., Canada, and a district sales office in Calgary. This new area will be under the management of H. L. Wilkins.

H. L. WILKINS

Wilkins takes to his new assignment an experience background in the oil-field-supply business extending over 30 years, having started at the Nelagony, Okla., store in 1919, as salesman. Later he served at other points as store man, store manager, field salesman, district sales manager, manager of branch stores, and as assistant to the engineering staff on refinery construction. For the last 2 years he has been assistant sales manager.

Greenstreet Heads Reed Office in Midland

W. H. (Buck) Greenstreet was recently named by Reed Roller Bit Co., to head its new offices in Midland, Tex. Greenstreet goes to his new post after having successfully completed 15 years of service with Reed's western sales division. He was formerly located in Lubbock, Tex.

Lane-Wells Announces Four Personnel Changes

Lane-Wells, suppliers of technical oil-field services, announces the following personnel changes: Fred Plumlee, formerly gun-perforator operator at Lane-Wells' Cisco, Tex., truck station, has been promoted to station superintendent. Plumlee has been with Lane-Wells since 1944, when he joined the firm as a rig man.

Courtney J. Ritchey, who has been handling operations in the Cisco area in addition to sales engineering, will now devote his full time to sales-engineering activities in that locality.

Two major changes in export personnel were also made by Lane-Wells. Robert Hall, formerly office sales engineer in the Los Angeles export office, was transferred to Petro-Tech, Venezuelan subsidiary of the company. Hall's transfer was made to effect closer liaison between the home office and Petro-Tech, and to expedite the shipping of United States-made Lane-Wells products to users in Venezuela.

Hall joined Lane-Wells more than 3 years ago. He attended University of Southern California and University of California at Los Angeles, majoring in foreign trade.

William Harris replaces Hall in the Los Angeles export office as office sales engineer. Harris joined Lane-Wells 2 years ago as a statistical aide.

Rowe, Williams Assigned To Regions by Edwards

Herbert J. Rowe, St. Louis, and Thomas J. Williams, Houston, have been appointed as sales engineers by Edward Valves, Inc., East Chicago, Ind. Rowe will work in the Great Lakes region with headquarters at

H. J. ROWE

T. J. WILLIAMS

the home office in East Chicago. Williams will serve in the southwestern states and will make his headquarters in Tulsa.

Rowe for the past 6 months has been training in the sales department of the home office. He is a graduate of University of Illinois. He also attended University of Texas and studied engineering at Purdue University.

Williams graduated in petroleum engineering from Louisiana State University. Prior to his undergoing a training course at Edward's home office, he had had oil-field experience while employed by Pate Drilling Co. and The Texas Co.

Davis, Wilson Named to New Cameron Division

C. W. DAVIS

Clyde W. Davis, former supervisor of products control, has been named general sales representative for the newly created commercial forging division of Cameron Iron Works, Houston, E. L. Lorehn, vice president and general manager, has announced.

D. E. Wilson, chief metallurgist at Cameron, also will work closely with the commercial forging division as a consultant to manufacturers.

Prior to joining Cameron nearly 2 years ago, Wilson was works manager with Portland Forge & Foundry Co., chief metallurgist for Studebaker

Automotive Co., aviation division, and chief metallurgist for Edwards Valve & Manufacturing Co.

American Appoints Cloer To New Tulsa Office

VIRGIL CLOER

Virgil R. Cloer has been appointed manager of the Tulsa office, American Manufacturing Co. of Texas, G. L. Messer, vice president, has announced. The new branch was opened in July in the Hunt Building to serve Northern Oklahoma and Kansas. Cloer was with Rector Well Equipment Co. before joining American and has had field experience with major oil companies and drilling contractors. He attended Texas Christian University in Fort Worth.

Tunstead Sales Manager of Koppers Metal Products

J. L. Tunstead, former general manager of Hearst Saturday Home Publications, who joined the central staff sales department of Koppers Co., Inc., in 1948, has been named sales manager of Koppers metal products division.

W. F. Perkins, Koppers vice president and general manager of the metal products division, announced the appointment to fill the vacancy created by the death of McMillan Robinson.

Before joining Koppers, Tunstead had been associated with Hearst publications in various capacities in Chicago and New York for 20 years.

New Corpus Christi Warehouse of A-1 Bit & Tool Co.

This new warehouse at Corpus Christi was recently opened by A-1 Bit & Tool Co. to serve the Gulf Coast area. Personnel of the new store are: V. D. Bowen, operator; R. L. Agee, district manager; J. W. Ritter, Jr., salesman; T. R. Swenk, salesman; H. B. Fikes, warehouseman; J. S. Cook, salesman; Henry Dunning, salesman. Jack Pratt, operator in the store, is not shown in the picture

Worthington Names New Sales Management Team

J. J. SUMMERSBY

T. J. KEHANE

John J. Summersby has been elected vice president in charge of sales by the board of directors of Worthington Pump & Machinery Corp. Thomas J. Kehane was made assistant vice president and general sales manager.

Summersby joined Worthington in 1916 as a student engineer. In 1919 he was assigned to the St. Paul district office as a salesman and later was made district sales manager. He was manager, Holyoke works sales, from 1929 to 1931; assistant general sales manager from 1931 to 1934; and since, assistant vice president and general sales manager.

Kehane studied engineering and architecture at Mechanics Institute and Pratt Institute, after joining Worthington in 1915. Since then he has advanced through various positions in the sales department, and in 1944 was appointed commercial vice president, Pacific Coast.

Speirs Opens Illinois Store

Clark Speirs, sales representative, who has recently established a store in Fairfield, Ill., for the sale of Globe Oil Tool Co. products, is here pictured correctly. An item announcing the opening of the store in last week's issue of the Journal was accompanied by a wrong cut. Speirs for several years sold and serviced Globe equipment in the Bakersfield and Los Angeles area.

Jones & Laughlin Managers Study New Equipment

District sales managers and executives of Jones & Laughlin Supply Co. getting first-hand information on new equipment and improvements on established lines at a recent 3-day meeting in Tulsa are: (standing) A. G. Chamberlain, L. R. Roberts, W. O. Hardy, D. T. Ottinger, J. K. Guinn, H. L. Wilkins, H. U. Everett, D. E. McCormick, H. J. McAdams, H. D. Stanley, H. H. Brown, W. R. Clarke, U. G. White, Jr., R. E. Howe, F. J. Kopp, M. L. Eubank, and J. K. Lytle. (Seated) middle row: R. W. Woods, Jr., H. E. Wagner, A. G. Bastain, Rainey Elliott, H. H. Wilson, J. L. Shakely, Robert McCoy, Jr., E. B. Thornburg, G. B. Chapman, M. A. Park, and J. A. Evans, Jr. Bottom row: F. L. McFarland, Doyne Carson, W. L. Vinson, A. A. Hopper, and J. W. Kaye

Lincoln Electric to Build $8,500,000 Plant

Lincoln Electric Co., according to James F. Lincoln, president, has completed final arrangements with Austin Co., of Cleveland, for the immediate construction of an $8,500,000 plant to be erected in Euclid, Ohio.

The one-story manufacturing plant will contain over 850,000 sq. ft. of floor area on a 65-acre site.. The new plant will be ready in 1950 for the transfer of all manufacturing operations from the present plant, which will be available for sale or lease at that time.

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

3—Type C-50 H. P. Superior Oil Eng. with 20" P.D., 7 Groove Pulleys & Idlers. 50 H.P. Fairbanks-Morse Type Y vertical oil Eng. flat 12" x 5' pulley, 165 H.P. Miller Twin gas eng. completely overhauled. All above in good operating condition. Brundred Oil Corporation, 208 Alameda Road, Kansas City 2, Mo.

FOR SALE: Practically new 70 B Brewster Drawworks equipped with G. M. Diesel 6 Motor & transmission, all friction clutches—automatic cathead. This drawworks has drilled 35,000 feet in shallow wells—being replaced by larger unit. Price $10,000.00 f.o.b. Salem, Illinois. Herman Graham Drilling Co., Box 176, Salem, Illinois. Phone 580.

PACKAGED H_2S REMOVAL UNITS

We offer prompt shipment on skid-mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.

GRAFF ENGINEERING & EQ'PT. CO
3415 Westminster, Dallas 5, Texas

EQUIPMENT FOR SALE

SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000' —Respooled for Your Inspection — Cable Tools for Sale. General Tool & Supply Co., P.O. Box 4387, Phone 61335, Oklahoma City, Okla.

FOR SALE: Failing "1500" portable rig for shot-hole, core, water-well, and shallow production drilling. Equipped with sand reel and bailer. Mounted on GMC truck. Rig and Truck in excellent condition. Rider & Montgomery, Box 523, Douglas, Wyoming.

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps—two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

FOR SALE

Used Oil Field Gas Engines

- 3—Model 145 GKU Waukesha special oil field units with gas engine starters, gas, gasoline, and butane burning equipment, and otherwise standardly equipped, less power take-off, mounted on oil field type steel skids. Location Okla. City, Okla. Price, each $2,820.00
- 2—Model 6-PCS-1875 Buda standard oil field power units, with gas engine starters, gas, gasoline and butane burning equipment and otherwise standardly equipped, less power take-off, mounted on oil field type steel skids. Location Duncan, Okla. Price, each $6,624.00
- These engines are practically new and guaranteed accordingly.
- 1—R-225 Climax 8 cylinder engine complete with gas, gasoline and butan carburetors, and engine starter, mounted on oil field type steel skid Location Duncan, Okla. Price "as is" $1,100.00

Address inquiries to Box D-108, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

5—35,000 bbl. steel tanks, riveted, 5' x 10' steel sheets, 6 rings high, complete shell, bottom, angles and ladder, cut down, rivets backed out, approximate weight 95 tons each. Price $3,500.00 each, gradesite, Stoy, Illinois.

W. C. BERRY
Box 1858 — Tulsa, Oklahoma — Phone: 3-6141

FOR SALE

Shot Hole Rig — **Water Well Rig** — **Core Rig**

National Type 1-D Drill; Hollow Kelly; Chain Pull Down; Mast 25' 6"; With Gardner-Denver Model FXF Pump, Size 4½ x 5; Above mounted on 1946 Dodge WHA 46, 16,000# GVW, 2 Ton, 148" WB; Sale Price $3,500.00

National Type 1-D Drill; Hollow Kelly; Chain Pull Down; Mast 25' 6"; With Gardner-Denver Model FXF Pump, Size 4½ x 5; Above Mounted on 1942 Chevrolet Truck 1½ Ton, 160" WB; Sale Price $2,500.00

THE ATLANTIC REFINING COMPANY
P. O. Box 2819
Dallas 1, Texas

EQUIPMENT FOR SALE

FOR SALE, at Birch Run, Michigan, #50 Oilwell geared power complete. 30 H.P. 2 cycle Type C Superior gas engine. #50 Oilwell belt tightener complete with shaft, bearings, and clutch. Circulating tank 16' x 19' house. All in good condition. $2000 as it stands. Was used to pump twenty-five 1540' wells in field now abandoned. Smith Petroleum Company, 401 Keeler Building, Grand Rapids, Michigan.

TWO storage tanks, 10,000 gallon each. Mounted on steel base. One 3 horsepower motor, 1 centrifugal pump, dog house, and other accessories. All in No. 1 condition. The entire lot $600.00 as is and where is. M. J. Regan, Coffeyville, Kansas.

FOR SALE: Complete outfit for water well drilling, in good condition, including: Rotary Mayhew 1000' drill, tank truck, supply truck, and house trailer. Also available for sale supply of pipe, pumps, etc. For details write to Buell-Edlund Drilling Co., Box 154, Miles City, Montana.

FOR SALE

3½ miles, new 4½" O.D. 11#, 1200# test API Continuous Weld Line Pipe, T & C, 78c per foot, f.o.b. cars Midcontinent area. Address inquiries to

Box D-120, The Oil and Gas Journal, Tulsa, Oklahoma

FOR SALE

12,000' — 7" casing used for vacuum line, standard weight, T&C, 55c per foot f.o.b. Charleston, West Virginia.

15,000' — 3" standard T&C line pipe used, 32c per foot f.o.b. Charleston, West Va.

3,267'—5½" 17# new seamless, R 2 casing, $1.50 per foot f.o.b. Victoria, Texas.

7,345'—5½" 13# used lap weld casing, 65c per foot f.o.b. Cunningham, Kansas.

ROGERS AND WRIGHT, INC.
710 Peoples Building
Charleston, West Virginia
(Phone 30-171)

FOR SALE

3—D8800 Caterpillar Diesel Electric Sets equipped with 75 KW Louis Allis Generators rated at 62.5 KVA continuous load, gasoline starting engines, oil coolers, Woodward Governors, 220 Volt, 3 Phase, 60 Cycle — complete with switchboard, synchronizing units, Westinghouse Circuit Breakers, Voltmeter — frequency meter, Watthour and Kilowatt Meter.

All in good condition and can be seen in operation in manufacturing plant in Midwest. Reasonably priced. Want to sell complete installation.

Box D-132
THE OIL AND GAS JOURNAL

FOR SALE

The following oil well equipment located at Bowie, Texas

New 10" casing $2.25 per ft.
Used 8" casing $1.25 per ft.
Used 7" casing 90c to $1.30 per ft.
Used 5½" casing 80c to $1.00 per ft.
Used 2" upset tubing 30c per ft.
New and used 2" and 3" line pipe
1—Parkersburg 40 H. P. pumping unit $2,000.00
2—Emsco 10 H.P. pumping units complete with Continental C-66 engines $1,700.00.
2—6' x 20' used heater treaters $1,000 each
2—250 Bbl. used bolted tanks $150.00 each
New and used ⅝" and ¾" sucker rods—10c to 30c per ft.
Miscellaneous fittings and well head connections.

NU-ENAMEL OIL CORPORATION
604 First National Bank Annex
Dallas, Texas
Telephones
Dallas Riverside 8160, Bowie 727

EQUIPMENT FOR SALE

HEAVY DUTY geophysical drill, 18' kelly, chain pull down, hydraulic lift mast, 4½ x 6 G. D. pump, Twin Disc clutches. Mounted on 1943 Ford Truck. Waters Drilling Service, 69 Beacon Place, Pasadena 8, Calif.

FOUR Lufkin single crank #31 C pumping units, complete with 30 H.P. General Electric motors. Full particulars, Wiegand Bros., Milam Bldg., San Antonio, Texas.

NATIONAL "50" Compound Double Drum Rig 126' Cantilever Ideco Mast, 10' substructure, 6,000' 4½" drill pipe, this rig complete and in excellent condition. P.O. Box 205 Sta. B. Bakersfield, California.

FOR SALE OR TRADE: Jumbo C. Fort Worth Spudder, trailer mounted, shear poles, E. 60 Allis-Chalmers power. With or without complete tool line, dog house, etc. Would trade for good string range #1 internal flush 2⅞ drill pipe, core barrel, etc. Box 378, Cherryvale, Kansas.

FOR SALE: McKissick Tubing and Floor Blocks. Save 50%. Melton Supply Co., Seminole, Okla.

FOR SALE: Two Fairbanks-Morse Diesel Engines, 150 H.P. Twin Cylinder, Horizontal Type. Completely overhauled. $1500.00 each. Melton Supply Co., Seminole, Okla.

3 CLARK Spudders No. 55, No. 50, and No. 25. Good condition. Any reasonable offer accepted. Box D-129, The Oil and Gas Journal, Tulsa, Oklahoma.

WICHITA 50 Spudder, now working, fully equipped to go 2500 foot depth. Pipe from 15 to 5 inch, Hercules engine, underreamers, tools, light plant, packers, tubing, etc. Cash price fifteen thousand. F. E. Hunt, Adair, Iowa.

FOR SALE: Cardwell Rotary Rig, complete with Mast. Suitable for 3,500 ft. drilling. Bargain. Terms. Melton Supply Co., Seminole, Okla.

COMBINED VAPOR SEPARATOR & FRACTIONATOR FOR THERMAL REFORMING

One (1) New 5'-6" ID x 61'-0" over-all height Bubble Tower made of 1¼" Plate and lined throughout with 5/64" and 7/64" thick, 11-13% Chrome stainless steel, type 405. Stainless steel support plates in place for 15 Trays, (Trays not included). Constructed in accordance with the API-ASME Code, stress relieved and radiographed. Designed for 400 PSI @ 750° F. Fabricated by A. O. Smith Corporation. Platform and ladder clips installed.

WOOD RIVER OIL & REFINING CO., INC.
335 West Lewis Street, Wichita, Kansas
Telephone 7-3325

BOILER PLANT FOR SALE

2—286 Horse Power Scotch Marine Boilers

1—300 Gal. Water Make-Up Tank

1—Boiler Feed Pump

1—10,000 Gallon Fuel Oil Tank with Internal Heating Coils

1—Fuel Oil Heater

6—Complete Leahy Oil Burners. All Accessories, Valves, Traps, Gages, Thermometers, Inter-Connecting Piping, etc. Complete Plant. Excellent Condition.

Boilers suitable for 150 lb. to 200 lb. operating pressure

Best Offer Will Be Accepted

U. S. ENGINEERING CO.
914 Campbell, Kansas City 6, Missouri

EQUIPMENT FOR SALE

FOR SALE: 1 UMT Allis-Chalmers tractor on new rubber with Cooper Winch. Price $1,000.00. 1 Skid type Cooper Unit—Price $2,000.00. 1 Skid type Cardwell H Spudder with MZR Waukesha Motor. New string of five inch tools with quick change-over sockets. New 4,000 foot line. Price $5,000.00. Also have Cardwell Model QS Unit with telescope pole. Mounted on truck. Might sell. These Units are in good condition and suitable for wells up to 3,500 ft. Fred Frogge, Leon, Kansas. Phone No's 4316 or 2952.

FOR SALE: Oil well casing and line pipe. Direct price and mill shipment. Plagenz, Park Building, Cleveland, Ohio.

NO. 3A6 National drilling machine with complete string of tools from 18" down. All in excellent condition. Located near Mannford, Oklahoma. Glied Oil Co., 110 Midco Building, Tulsa, Okla., Phone 5-2251.

FOR SALE at Barnsdall, Oklahoma, warehouse: 1—5" x 16" Goulds Vertical Triplex Single Acting Pump, Fig. 1585, Ser. No. 37835, Gear Ratio 5.06:1, 36 RPM, 5,000 BPD, 800# WP. Price $750.00. Suitable for waterflood project. Cities Service Oil Co., Patridge, Bartlesville, Okla.

6000-FT. ROTARY RIG, diesel powered, complete with 4½" drill pipe, ready to drill. Near Alice, Texas. Full particulars and price, Wiegand Bros., Milam Bldg., San Antonio, Texas.

ONE—36L Bucyrus-Erie Spudder, New type and design, complete with steel dog house, Kohler Light Plant 1½KW, has 7" and 5" tools (Note—This machine is in excellent condition). Priced $21,000.00. One New D7 Caterpillar Tractor, equipped with 8' LaPlante Choate inside bull-dozer, 3 speed, Hyster-winch. This tractor has less than 200 hours. Excellent shape. A. M. Perrine, P.O. Box 87, Salem, Illinois. Phone 1064 or 901W4.

FOR SALE in our Pampa gasoline plant. Two 163 horsepower 207# working pressure Wm. Bros water tube boilers complete with boiler house, pumps, and all auxiliary equipment. Now available. Cities Service Oil Co., Patridge, Bartlesville, Oklahoma.

FOR SALE: Sullivan 300A drilling rig complete ready to move to job, terms to reliable party. Phone 6508 or 3996, P.O. Box 301, Abilene, Texas.

NEW 6⅝" O.D. API LINE PIPE

Seventy-three (73) Miles New 6⅝" O.D. 13# API Electric Weld Line Pipe, Plain End, Beveled for Welding, Regular Mill Coating, double random length Van Dyke Protectors Applied. Rock Island Oil & Refining Co., Inc., 335 West Lewis Street, Wichita, Kans. Telephone 7-3325.

FOR SALE

12—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

NEW FRACTIONATING TOWER REFLUX DRUM

One (1) New fractionating tower, 5'-0" I.D. X 89'-6" over-all height X 1⅛" plate. Thirty-four (34) bubble trays, ten (10) 18"-300# manways. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

One (1) new horizontal reflux drum, 5'-6" I.D. x 18'-6" over-all length x 1⅛" plate. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

ROCK ISLAND OIL & REFINING CO., INC.
335 West Lewis St. Wichita, Kansas
Phone 7-3325

EQUIPMENT FOR SALE

FOR SALE: 10,000 ft. 20" OD x ¼" Wall New Electric Weld Steel Pipe, Double Random Lengths; 50,000 ft. 18" OD x ⅜" Wall Used Steel Pipe, Single Random Lengths. Utility & Industrial Supply Company, 921 Michigan Ave., E., Jackson, Michigan.

FOR SALE: Two like new 74,000 bbl. cap. tanks. Low price, at Morgantown, W. Va. 2 new 10,000 bbl. bolted at N.Y. Darien Corp., 60 E. 42nd St., N. Y., N. Y.

TANK HEATERS
Thermetal Co., Sales Engineers
4529 Gillham, K. C. (4), Mo.

GEOPHYSICAL RIGS for sale, or will furnish rigs and help finance experienced driller starting in contracting business. Write Box D-123, The Oil and Gas Journal, Tulsa, Okla.

HELP WANTED

GEOLOGIST with current or recent active experience in West Texas wanted for geological department of independent oil company located in Midland, Texas. Excellent opportunity for man under forty years age who can organize, direct and administer all phases of an aggressive geological program leading to the development of production. Personal interview may be arranged based on merit indicated by a written outline of past experience and training. All replies will be handled in confidence, and should include date of availability and starting salary desired. Recent photo or snapshot would be helpful. Address Box D-139, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Mechanical Engineer. Experienced in design of pumping units and well head equipment. Excellent opportunity for right man to become Chief Engineer for well established company. State age, qualifications, experience. Address: Box C-967, The Oil and Gas Journal, Tulsa, Oklahoma.

HOUSTON DISTRICT Sales Engineer: Engineer familiar with pumps, compressors, exchangers, etc., having sold this type of equipment in Texas for at least the last 3 years to refinery, gasoline plant, and pipe-line companies. Replies confidential. Box D-117, The Oil and Gas Journal, Tulsa, Oklahoma.

GAS SCOUT to work from main office of large independent company. Chemical or petroleum engineering education with minimum of five years field experience required. Must be thoroughly familiar with gas measurement, gas testing, and estimation of reserves. Give full details of education and experience in first letter. All replies confidential. Box D-141, The Oil and Gas Journal, Tulsa, Oklahoma.

CONSTRUCTION MAN
For 2-year project, with civil engineering and pipe line building experience, top references. Address Box C-981, The Oil and Gas Journal, Tulsa, Oklahoma.

YOUNG engineer experienced in cable tool and rotary drilling with sales engineering ability and also experienced cable tool driller for connection with large water well drilling contractor in the North and Middle West. Box D-128, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERS, Executives, Technical Men. Salaried positions—$3600 to $30,000. This confidential service for outstanding men who desire a change of connection, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 1204 Berger Bldg., Pittsburgh 19, Pa.

WELL HEAD EQUIPMENT SALES AND SERVICE REPRESENTATIVE

For Oklahoma territory. Man needed for service and sales work on well heads and valves. Must be experienced in production, live in Oklahoma, and not afraid of work. Reasonable salary. Communicate by letter with full particulars to

LAWRENCE G. WOOD
McEvoy Company, P.O. Box 1841,
Oklahoma City 1, Oklahoma

HELP WANTED

M.C.B. CLERK. Oklahoma. Must have working knowledge of A.A.R. rules; be able to do complete billing, checking and inventory work. State age, qualifications and experience. Reply Box D-124, The Oil and Gas Journal, Tulsa, Oklahoma.

NEW foreign and domestic Oil Employment Directory. Over 500 listings in drilling, production, refining, natural gasoline, pipelines, geological, exploration, supplies, manufacturers, services; and trucking, refinery and pipeline contractors, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla. (Our 29th Year).

GEOPHYSICIST

A well established, major geophysical company wishes to employ a highly qualified party chief. The individual must have a college degree, a minimum of 2 years actual experience as a party chief, and be willing to move with the seismic party. This is a solicitation for a man of outstanding calibre who has the capacity to advance in a company with a high regard for its present good reputation. Give age, education, experience, salary expected, references, and all other appropriate details in first reply. Reply to Box D-136, The Oil and Gas Journal, Tulsa, Oklahoma.

CONSTRUCTION MEN

Welders, Ditch and other inspectors. Salary and flat expense allowance. Box D-137, The Oil and Gas Journal, Tulsa, Okla.

WANTED—By progressive, substantial independent oil producing company, an experienced production man of age 30 to 40. Must be capable of running a District, and be thoroughly experienced in all phases of production and well completions. Engineering background desirable but not required. Residence will be in Oklahoma City. This is an excellent opportunity for an alert, aggressive, experienced man. Give full particulars of experience and references first reply. Box D-134, The Oil and Gas Journal, Tulsa, Oklahoma.

ILLINOIS independent has position open for man under 40 experienced in accounting in oil field operations including production and drilling. State qualifications, experience, and salary expected. Locate Robinson, Illinois. Box D-127, The Oil and Gas Journal, Tulsa, Oklahoma.

RESIDENT ENGINEER, refinery or gasoline plant construction. Immediate employment. Box D-133, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

MAJOR company employee desires work with independent organization. Primary duty—land work. References furnished. Box D-140, The Oil and Gas Journal, Tulsa, Oklahoma.

EXECUTIVE with thorough knowledge of refinery operations and materials desires to represent manufacturer of nationally advertised products. Box D-115, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY OPERATING EXECUTIVE SEEKS CHALLENGING JOB

The writer has a responsible refinery job now but wants a better one which will demand full exercise of everything he learned in school and in 13 years experience in refineries in many parts of the country, directing the production of gasoline and its components under war time and peace time conditions.

I am a chemical engineer, 36, thoroughly acquainted with refinery operations and techniques, especially familiar with all processes for making and treating motor fuel—including both Fluid and Thermofor Catalytic Cracking. Men like me and work for me—and I like them.

Married and have two children. We'll go anywhere opportunity calls. Box D-121, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEER-SUPERINTENDENT — M.S. in Ch.E., age 35, registered Texas engineer, thorough knowledge refining, nine years varied experience engineering and plant supervision, most recently manager small refinery, available at once due to plant shut down. Write WRS, Box 112, Winnsboro, Texas.

LAND MAN, thoroughly experienced in buying and title work, licensed attorney, desires connection with company or individual. Box D-138, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

PETROLEUM ENGINEER: B. S. Six years excellent drilling and production experience; wants supervisory position with aggressive Gulf Coast Independent. Box D-116, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEER with fifteen consecutive years experience directing engineering, construction, and operation of refining and gas processing plants and facilities, and engaged in consulting work for past several years, desires permanent connection requiring top flight engineering and management ability. Box D-125, The Oil and Gas Journal, Tulsa, Okla.

OFFICE and warehouse clerk with executive ability, three years in Venezuela, good references, wide oil experience, will accept foreign employment, available in three weeks: Post Office Box 264, Hamilton, Ontario.

INDEPENDENT oil operator desires connection as land man; close deals. Age 38. Experienced all phases oil industry. Available about 30 days; anywhere. Box D-131, The Oil and Gas Journal, Tulsa, Oklahoma.

BUSINESS OPPORTUNITIES

$40,000.00 to invest in enterprise which will make full use of my ability. Graduate engineer, wide experience foundations, pipe lines and executive. Box D-135, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

88,000 ACRES Southern Tennessee Timber—Mineral land. No reservations $3.50 acre. Details, Earl Jester, 12744 Vanowen, North Hollywood, California.

LEASE AND DRILLING BLOCKS

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W. P. Harley, Bowling Green, Ky

HAVE three small leases in sight of new oil strike at Seventy-Six, Clinton County, Kentucky, of 200 bbl. daily. Will take royalty override only, if taken quick. John A. Damron, Albany, Kentucky.

WILL BUY oil leases anywhere, large or small blocks if any likelihood of oil field or good geology, provided you co-operate in furnishing all necessary information. Write fully what you have. Box 2153, Denver, Colo.

2,600-ACRE semi-proven drilling block, north Texas, $10 and 1/16 override, an extraordinary opportunity; others. P. O. Box 1392, Dallas, Texas.

SELL or lease 88,200 acres, agricultural, mineral, estimate timber 125,000,000 board feet, unimproved, not solid body, very low price, terms, southern Tennessee. P. O. Box 1392, Dallas, Texas.

FOR SALE: Approximately 900 acres—Rogers County, Oklahoma. 40 wells, depth 400 foot. Burges sand. Full particulars. M. J. Regan, Coffeyville, Kansas.

NEW MEXICO OIL FIELDS

OPERATORS, LEASE & ROYALTY BUYERS, We recommend Royalty close to production in Cross Roads Field under Major Co. operation. Leases & Royalty in the new shallow Permian Oil Field near production. Maps & Data on request. Our unbiased engineering reports give the facts.

W. J. PETERMAN
Portales **New Mexico**

LEASES ROYALTIES

PRODUCING OR NONPRODUCING

Texas, New Mexico, Oklahoma, Louisiana and Illinois

Inquiries Invited

B. D. BUCKLEY

60 Broadview Drive, Clayton (5), St. Louis, Missouri

ROYALTIES

DEEDED ROYALTIES

San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ROYALTIES IN HOT AREAS!

Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

CASH MARKET for PRODUCING ROYALTIES
ROBERT L. KINKAID
World Bldg. Tulsa, Oklahoma

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908 Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma

WANTED

WANTED to make contact with small contractor with portable rotary equipment for drilling 16" to 10" holes 1000 to 1500' deep in the Dakotas on per footage basis. Advise size and type of equipment available. Box D-130, The Oil and Gas Journal, Tulsa, Oklahoma.

OFFICE SPACE

TULSA RENTAL SPACE

Want to locate your Executive Offices in the Oil Capital, Downtown Tulsa? We have 8,000 sq. ft., main floor, office space, Tri-State Insurance Bldg. (All or half). One of those **once in a life-time** opportunities.

Phone . . . Write . . . Wire

LLOYD A. SWAIN
Tri-State Insurance Co. Phone 3-8141, 619 South Main St., Tulsa, Oklahoma

Indiana Fields

(Continued from page 140)

SW SE NW 20-7s-12w, 1½ mile east of the LaMott pool, Posey County, swabbed at the rate of 25 bbl. per day when testing open hole in the Hardinsburg sand at 2,070-77 ft., and looks like a new pool opener in that pay. Later, in a test of the Waltersburg sand, in which good oil showings also were encountered, and in which casing, cemented at 2,069 ft., was perforated at 1,840-48 ft., it got a 400-ft. fill-up with water. A squeeze job has been attempted in an effort to shut off the water.

INDIANA SUCCESSFUL WILDCATS

Gibson County: John S. Buchman and C. E. O'Neal 1 Barrett, SW SE NE 7-3s-11w, IP 80 bbl., Cypress 2,099-2,111 ft., TD 2,121 ft.

Spencer County: George Dobbs 1 Williams, SE SE SW 22-6s-7w, IP 10 bbl., Waltersburg 947-56 ft., TD 956 ft. (Discovery well Sweezer pool).

INDIANA WILDCAT FAILURES

Gibson County: J. M. Cline 1 Gilmore, NE NE NW 4-2s-11w, dry, TD 2,323 ft.

A. J. Slagter 1 Cleveland, NE NE NE 31-3s-11w, dry, TD 2,625 ft.

Posey County: J. B. Buchman 1 Miller, NE SW NE 22-7s-12w, dry, TD 2,740 ft.

Sullivan County: Gilliam Drilling Co. and Sohio Petroleum Co. 1 Merrill, SE SE SE 9-8s-9w, dry, TD 2,489 ft.

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CALENDAR

August

United Nations Scientific Conference on the Conservation and Utilization of Resources, U. N. Interim Headquarters, Lake Success, N. Y., August 17-September 6.

Western Petroleum Refiners Association, regional technical meeting, symposium on diesel fuels, Leonard Refineries, Inc., plant, Alma, Mich., August 19.

September

Interstate Oil Compact Commission, summer quarterly meeting, Stanley Hotel, Estes Park, Colo., September 1-3.

American Institute of Chemical Engineers, Mt. Royal Hotel, Montreal, September 6-9.

Pacific Coast Gas Association, fifty-sixth annual convention, Santa Barbara, Calif., September 7-9.

Instrument Society of America, annual meeting and exhibit, Municipal Auditorium, St. Louis, September 12-16.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

American Chemical Society, 116th national meeting, Atlantic City, N. J., September 18-23.

American Association of Oilwell Drilling Contractors, ninth annual meeting, Baker Hotel, Dallas, September 19-21.

National Butane-Propane Association, Jefferson Hotel, St. Louis, September 19-21.

Mid-Continent Oil and Gas Association, twenty-seventh annual convention, Louisiana-Arkansas division, Roosevelt Hotel, New Orleans, September 22-23.

American Institute of Mining and Metallurgical Engineers, regional meeting, Neil House, Columbus, Ohio, September 25-26.

American Society of Mechanical Engineers, fall meeting, Erie, Pa., September 28-30.

October

Independent Petroleum Association of America, Texas Hotel, Fort Worth, October 2-4.

American Society of Mechanical Engineers, petroleum division, 1949 Petroleum Mechanical Engineering Conference, Biltmore Hotel, Oklahoma City, October 2-5.

National Association of Corrosion Engineers, South-Central Regional Division, annual meeting, Adolphus Hotel, Dallas, October 3-4.

National Lubrication Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Plaza Hotel, San Antonio, October 5-7.

California Natural Gasoline Association, Ambassador Hotel, Los Angeles, October 7.

American Association of Petroleum Geologists, regional meeting, Buena Vista Hotel, Biloxi, Miss., October 12-14.

Symposium on Instrumentation for the Process Industries, fourth annual session, School of Engineering, Texas A. & M. College, College Station, Tex., October 12-14.

American Society for Testing Materials, first Pacific area national meeting, Hotel Fairmont, San Francisco, October 10.

Texas Mid-Continent Oil and Gas Association, annual meeting, Rice Hotel, Houston, October 13-14.

Oil Progress Week, October 16-22.

American Gas Association, annual convention, Chicago, October 17-20.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Elk's Club, Los Angeles, October 20-21.

Independent Natural Gas Association of America, annual meeting, Baker Hotel, Dallas, October 31.

November

Society of Automotive Engineers, diesel, Chase Hotel, St. Louis, November 1-2.

Society of Automotive Engineers, fuels and lubricants, Chase Hotel, St. Louis, November 3-4.

American Petroleum Institute, annual meeting, Stevens Hotel, Chicago, November 7-10.

Petroleum Electric Power Association, annual conference, Hotel Beaumont, Beaumont, Tex., November 17-18.

Society of Exploration Geophysicists, regional exploration meeting, Adolphus Hotel, Dallas, November 17-18.

American Society of Mechanical Engineers, annual meeting, Hotel Statler, New York, November 27-December 2.

December

American Institute of Chemical Engineers, annual meeting, William Penn Hotel, Pittsburgh, Pa., December 4-7.

NOMADS

Houston Nomads, second Monday of each month, Ye Olde College Inn, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

Carbon Black From Crude Not Taxable in Texas

The Texas Supreme Court has ruled that carbon black manufactured from crude oil is not subject to the state occupation tax.

The court established the point of law in refusing an appeal by the state comptroller from a lower court which held Philtex Chemical Co. was not subject to the taxes. Previously the state legislature had refused to revise the occupation tax law to include the crude-based product.

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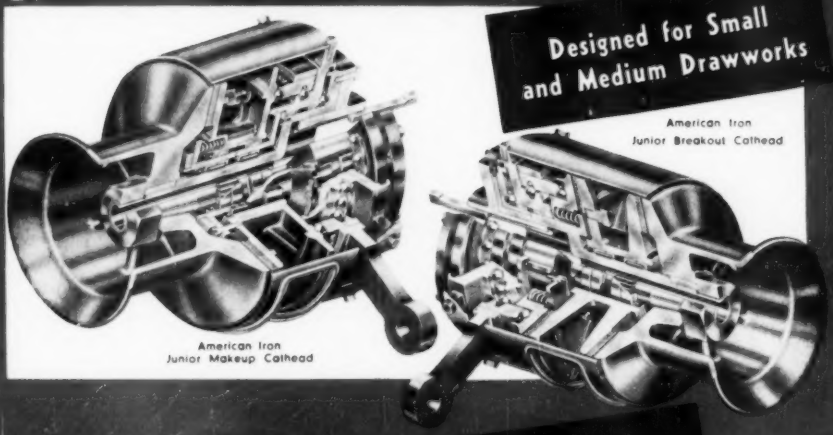

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